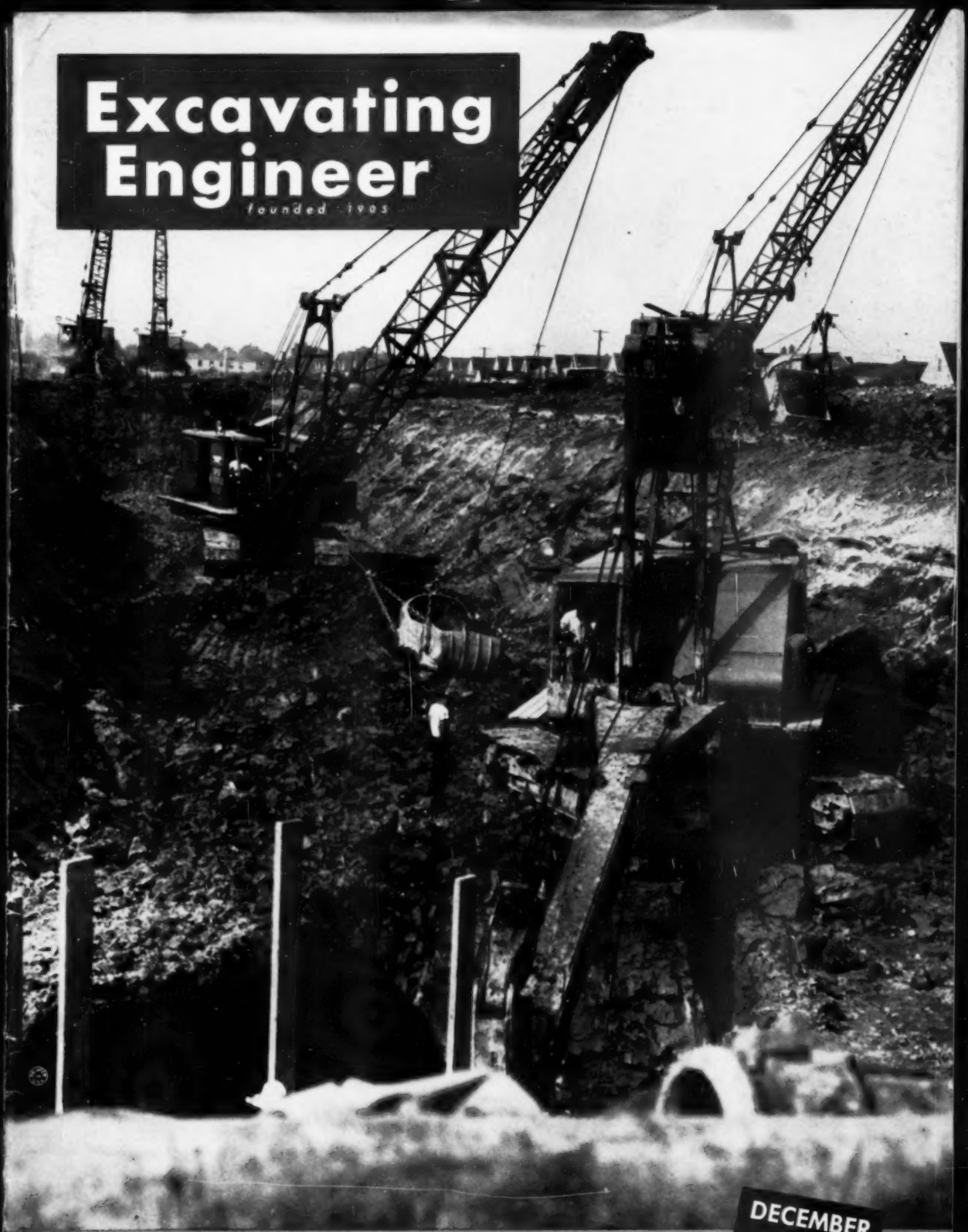
Excavating Engineer

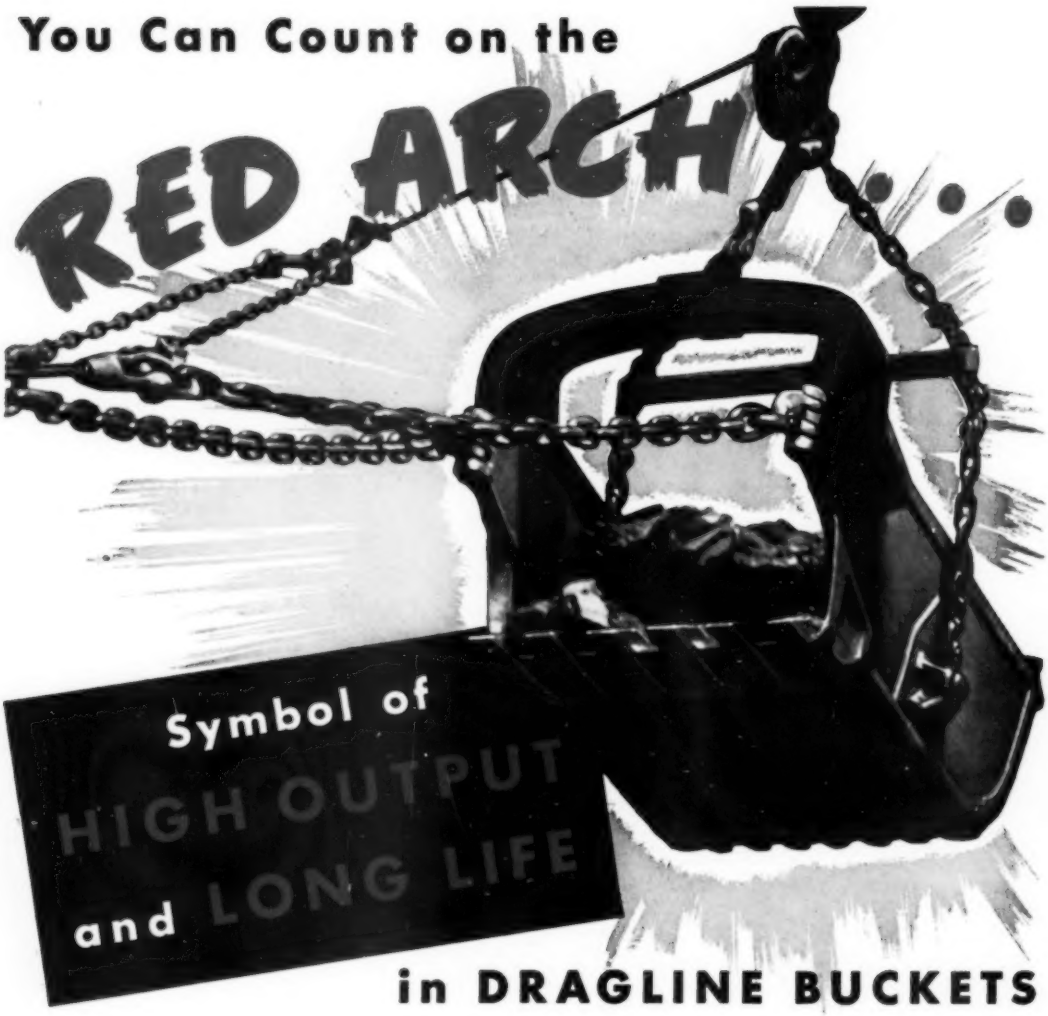
founded 1905



DECEMBER 1952

A PASS AND TWO LATERALS move dirt from 40-ft. deep Chicago sewer trench to stockpile. A 2½-yd. dragshovel in the cut excavates 17-ft. wide, 28-ft. deep final trench and passes dirt back. A 2-yd. dragline then relays dirt to side of cut where a 1½-yd. dragline picks it up. Story of deep-cut sewer begins on page 24.

You Can Count on the RED ARCH . . .



in DRAGLINE BUCKETS

Red Arch buckets have what it takes to deliver steady, high output on heavy construction . . . and to stay *on the job.*

One big reason is that they're built of special alloy steels which provide ample strength without excess weight. Another is famous Red Arch design which enables them to load fast and easy . . . carry without bobbing or spilling . . . and to dump quick and clean. Combined with self-cleaning hoist trunnions, heavy-duty runner bars and renewable heel plates, that mean real on-the-job dependability.

Standing up under punishment . . . staying out of the repair shop also means bigger output over the long pull, and lower overall costs. Standardize now on Red Arch buckets and get these big advantages working for *you.* There's a type and size Red Arch bucket for every dragline application . . . 3/8 to 30-yd. Write for complete information.

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SOUTH MILWAUKEE
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MONEY SAVER

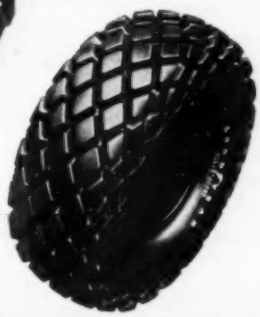
on rock-ridden jobs

You know what it takes to make every hour of every working day count—but BIG. That's where Goodyear's super-tough Hard Rock Lug stays right with you!

It stands the gaff because that's what Goodyear builds it for! Its massive lug-bars shrug off bruising rocks, resist tire-killing snags. It gives you *full-pull* on the toughest terrain that ever jinxed a job!

So why let troublesome tires eat up your profits? That rugged muscle-man—the Hard Rock Lug, by Goodyear—is job-insurance!

SURE-GRIP
In name and action! Drive-wheel traction champ for graders and scrapers.



HARD ROCK LUG
— super-tough champ for all kinds of rock work.

ALL-WEATHER
— finest for flotation, rolling big loads faster.

FOR EACH JOB, THERE'S A COST-CUTTING GOODYEAR TIRE!

All-Weather, Sure-Grip—T.M.'s
The Goodyear Tire & Rubber Company, Akron, Ohio

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MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

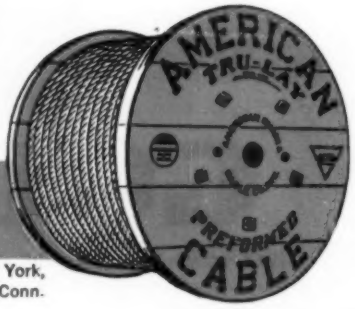
We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

TRU-LAY Preformed WIRE ROPE

● For each use there is *one best* wire rope . . . one that will stand repeated loading, abrasion, crushing, or continuous bending, and be the best rope to buy.

To achieve this, there is a TRU-LAY Preformed Wire Rope made in a special construction for your equipment. This construction has the exactly right combination of strength, bending life, and resistance to wear and crushing that you need.

The one best wire rope . . . TRU-LAY Preformed . . . will last you longer and cost less to use. Specify and get TRU-LAY Preformed improved plow steel—the rope identified by the Green Strand.



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Excavating Engineer

founded 1905

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Regular Subscription (payable in advance): 35 cents per copy, $3.50 a year; Canada and foreign, subject to publication policy, $5.00 per year. Special subscription: Upon written request on company letterhead this publication will be sent free of charge to companies, executives and supervisors engaged actively in excavating. Occupation of subscriber must be given for all subscriptions, paid or special. Right is reserved to refuse foreign subscription. Indexed by Engineering Index, Inc. Volumes available on microfilm.

Published Monthly by

THE EXCAVATING ENGINEER PUBLISHING COMPANY

South Milwaukee, Wisconsin, U.S.A.

E. M. HEUSTON, Publisher
W. C. VAN DYKE, Editor
M. B. JAEGER, Managing Editor
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800,000 YARDS OF CONCRETE will be needed to complete Lookout Point Dam on the Willamette River near Lowell, Oregon. G-E powered cableway—2600 feet long with 25-ton hook capacity—is of radial type, with stationary 428-foot-high head tower and movable tail tower. Maximum conveying speed is 1800 fpm, maximum hoisting speed is 470 fpm.

Complete electrification keeps Lookout Point on schedule

Morrison-Knudsen selects G-E drives to batch and place concrete at Oregon dam

To meet a tight work schedule at the Corps of Engineers' Lookout Point Dam, the Morrison-Knudsen Co. relies on modern construction equipment—electrified throughout by General Electric. This equipment, spearheaded by a Travelift cableway built by Construction Improvements Ltd., and Lidgerwood Industries Inc. is helping to place an average of 2000 yards of concrete per day.

Lookout Point, an earth-and-gravel-fill dam located at Lowell, Oregon, is a combined flood-control and power-generation project scheduled for 1953 completion. To heavy construction people, it provides one more example of the effective use of *electrified* equipment on jobs where smooth, dependable operation is an everyday "must."

Whether you buy or build construction equipment, you'll find it's safer, more flexible, and more efficient when electrified by G.E.—with skilled engineering help in application, installation, and service. Find out how this equipment and service can pay off for you by contacting your nearest G-E Apparatus Sales Office. General Electric Co., Schenectady 5, N. Y. 664-25

CABLEWAY is driven by this G-E 500-hp, 2300-volt wound-rotor motor. G-E drives also power conveyors, rock crushers, and batch-plant equipment.

CENTRALIZED CONTROL equipment for cableway includes (left to right) Limitamp high-voltage primary panel, secondary control, and cast-grid resistors.

Engineered Electrical Systems for Heavy Construction

GENERAL ELECTRIC

SIMPLICITY OF DESIGN

SHOVEL
CRANE
DRAGLINE
PULLSHOVEL

began with the FIRST NORTHWEST

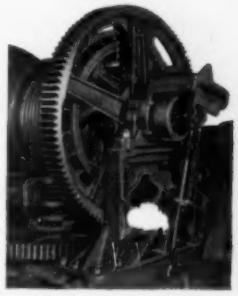
Simplicity *is* important! Northwest Shovels, Cranes, Draglines and Pullshovels were all *introduced* with this as a basic principle of design.

The early Northwests were characterized by a minimum number of shafts and gears. Drums were mounted side by side—All high-speed shafts rolled on ball or roller bearings—There were no high-speed chains with their devices for keeping them tight.

Northwest has preserved the principle of simplicity all through the years. Today's Northwests, too, are characterized by a minimum number of shafts and gears with ball and roller bearings on all high speed shafts. *Simplicity* means ease of upkeep, reduced "down time"—more output—and that is one of the main reasons why one out of every three Northwests sold is a repeat order. You can't have Northwest advantages without owning a Northwest!

NORTHWEST ENGINEERING COMPANY
1506 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

SIMPLE CONTROLS

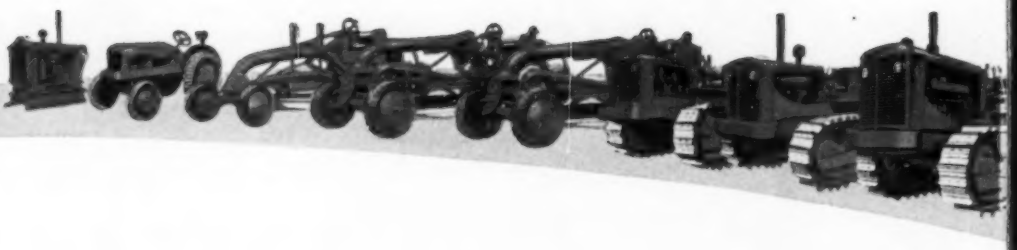


Here is the device that makes Northwest operation easier. It consists of a simple drum mechanism mounted on the end of the drum shaft. Through it the heavy clutches are shifted by the power of the engine. No compressors, no valves, no pumps. It's typical of Northwest Simplicity of Design.

it's another

NORTHWEST

- SHOVELS
- CRANES
- DRAGLINES
- PULLSHOVELS



Now... the famous MOTOR SCRAPER joins the A-C line

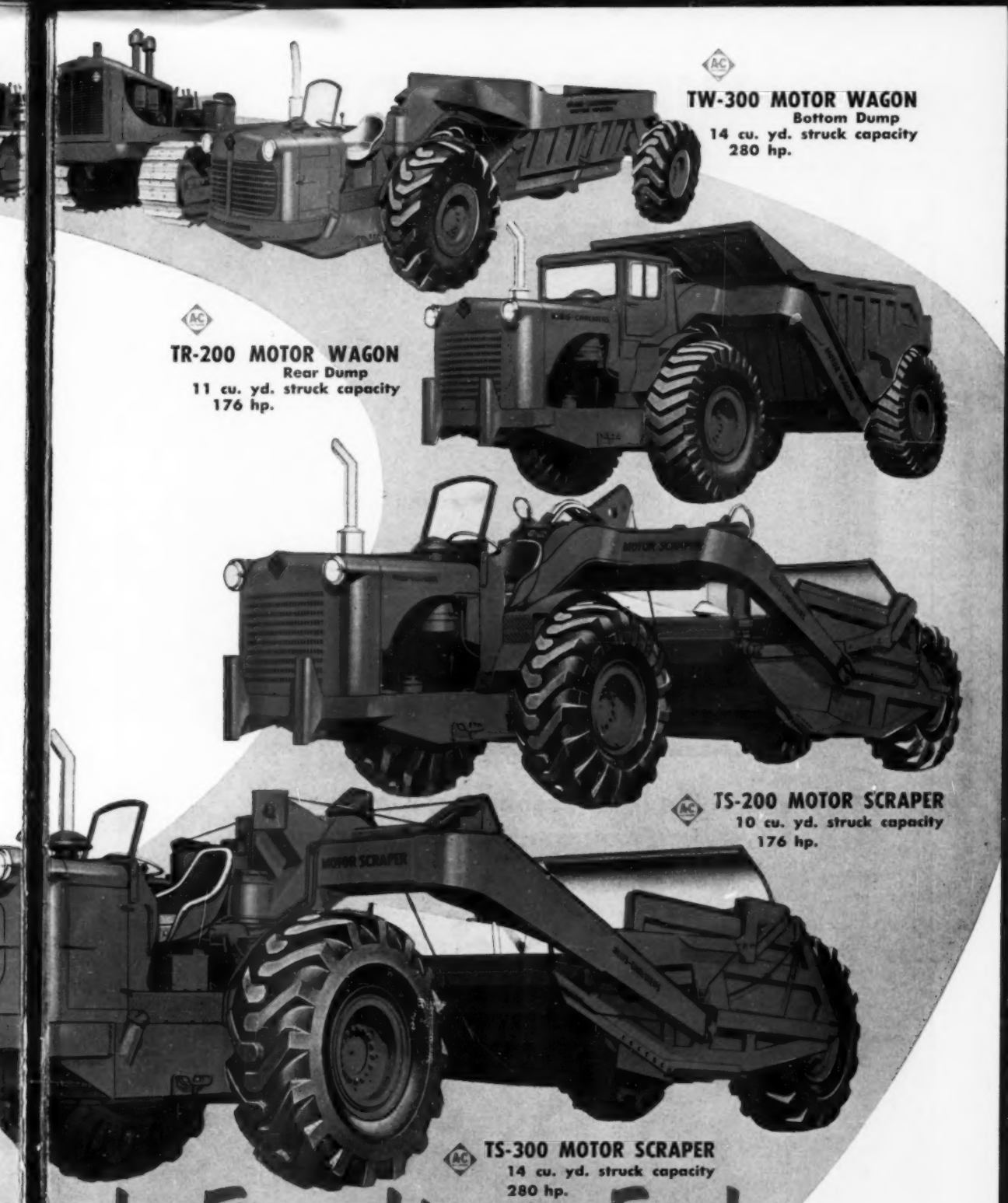
In order to serve you more completely, Allis-Chalmers has extended the *Finest Line on Earth* by adding the famous MOTOR SCRAPERS and MOTOR WAGONS formerly manufactured by LaPlant-Choate. This customer-accepted line meets A-C's 4-point quality requirements in every way.

These big self-propelled units are *designed for your job* . . . easy loading, high-speed hauling and quick, clean ejection. They're *built to take it* . . . job-tested, job-proved through years of use all over the world. Like Allis-Chalmers other earthmoving equipment, the MOTOR SCRAPER is *easy to operate . . . simple to service.*

Today's jobs require a more careful selection of equipment. That's why you'll be money ahead if you make your nearby industrial A-C dealer your headquarters for crawler tractors, motor graders, MOTOR SCRAPERS and MOTOR WAGONS. Stop in soon to discuss your job requirements and see his complete parts and service facilities.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



TW-300 MOTOR WAGON
Bottom Dump
14 cu. yd. struck capacity
280 hp.

TR-200 MOTOR WAGON
Rear Dump
11 cu. yd. struck capacity
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TS-200 MOTOR SCRAPER
10 cu. yd. struck capacity
176 hp.

TS-300 MOTOR SCRAPER
14 cu. yd. struck capacity
280 hp.

the Finest Line on Earth

WIRE ROPE

This is the most economical rope we've ever made for excavating and construction

JUST MENTION wire rope and most everyone thinks of Roebling. For one thing, Roebling made the first wire rope in America. But what's more, we've always led in developing better wire rope for the needs of every branch of industry.

Roebling Preformed "Blue Center" Steel Wire Rope is today's best bet for excavating and construction. It's safe, dependable and stands up under rough going. It saves you time and cuts costs.

There's a Roebling wire rope of the right specification for top service on any job. Call on your Roebling Field Man for his recommendations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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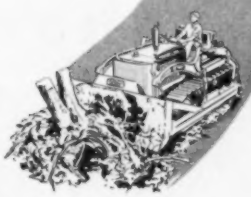
How to Make Time ON HIGHWAY WORK



FAST working Bucyrus-Erie Bullgraders and Bulldozers will help keep you on schedule on the toughest road building jobs. Here are just a few reasons why:

1. They're designed and built exclusively for use with International crawler tractors . . . balanced just right to take advantage of full tractor power for fast maneuvering and smooth, accurate dozing and grading.
2. There's instant, accurate control with either cable or hydraulic machines. Low pressure hydraulic system delivers ample power without excessive heat or pump wear. Front or rear-mounted power control winches of improved planetary design assure smooth power flow and instant action on cable operated machines.
3. Scientifically curved moldboard *rolls* dirt — does not just push it. There's less load resistance so you move more dirt with less power, get less tractor wear.

Remember Bucyrus-Erie Bullgraders and Bulldozers when you really want to *make time* on highway construction. And for big output on long-haul dirt, find out about the many advantages of the Big Red Team — Bucyrus-Erie B-type scraper and International TD-24 tractor.

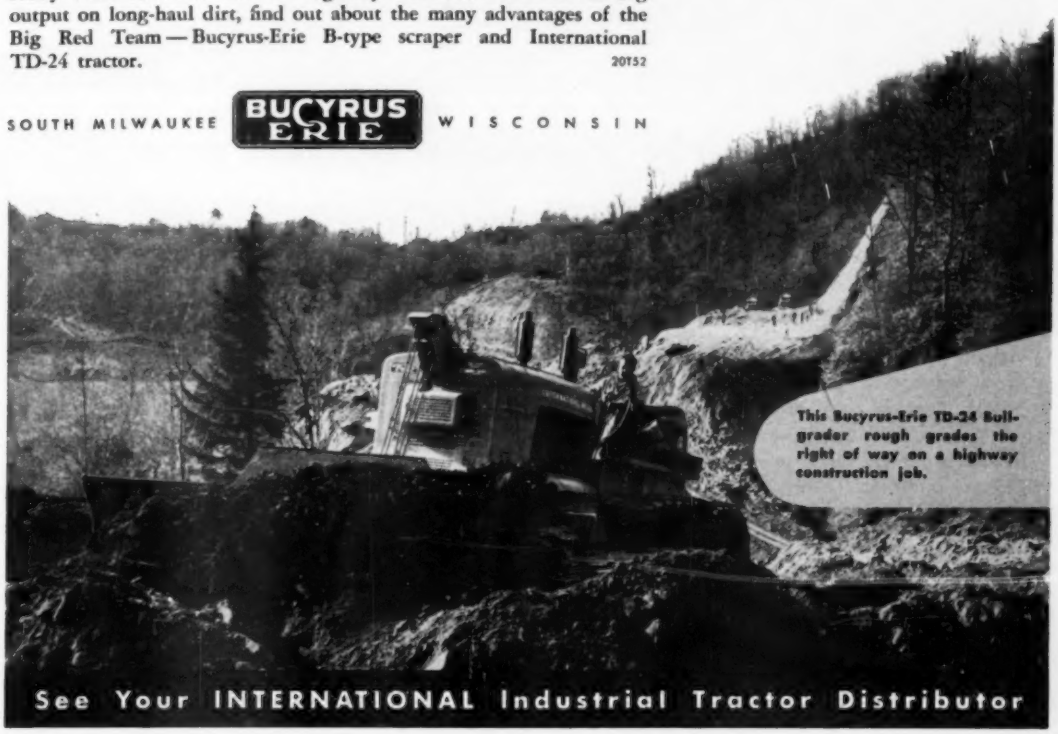
20T52

Choose

FROM THIS COMPLETE LINE

Cable operated Bullgrader and Bulldozer equipment is available for International TD-14A, TD-18A, TD-24 tractors. Hydraulically controlled equipment is available for all International tractors up to and including the TD-18A.

SOUTH MILWAUKEE BUCYRUS ERIE WISCONSIN



This Bucyrus-Erie TD-24 Bullgrader rough grades the right of way on a highway construction job.

See Your INTERNATIONAL Industrial Tractor Distributor

increases hourly yardage output over 10% with Koehring *fast-shuttling* DUMPTORS

THERE is no need to turn at the loading unit, along narrow haul roads, or on the fill with fast-shuttling 6-yard Dumptors. Koehring constant-mesh transmission gives the same 3 fast speeds forward and reverse, lets Dumptors operate with equal ease in both directions. Every turn saved cuts 15 seconds off your cycle time, and adds up to an important increase in yards hauled per hour. Here's a typical example:

On a 1,000-foot haul, eliminating only 2 turns saves ½ minute every round trip. Where you would get an average of 13.6 trips per hour with 2-turn operation, Dumptor *no-turn shuttle hauling* gives you 15.4 trips — an increase of 1.8 trips an hour on the same 1,000-foot haul.

Fast, easy spotting and 1-second gravity dump help keep production high. Costs stay low because there are no complicated, mechanical body hoists to slow up haul cycles — no expensive hoist maintenance or down time to eat into your profits. Let your Koehring distributor show you Dumptor's many other cost-cutting advantages.

KOEHRING COMPANY, Milwaukee 16, Wis.
Subsidiaries: JOHNSON • PARSONS • KWIK-MIX

KOEHRING (KOEHRING K HEAVY DUTY) **DUMPTOR®**

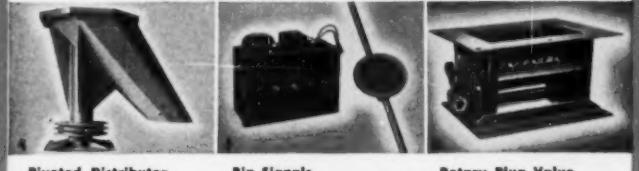
This mountain-side job shows typical no-turn shuttle advantage. Hauling along narrow ledge, Dumpster spots close to Koehring 1½-yd. 605, gets its load, drives to fill, dumps, returns to shovel — without turning.

INCREASE BATCH PLANT PROFITS
with Johnson accessories

Rotary Vane Compressor gives 7 cu. ft. air pressure per min. cement aeration. 15-lb.-limit relief valve.

Aeration Fittings properly spaced in Johnson bins and silos keep cement free flowing.

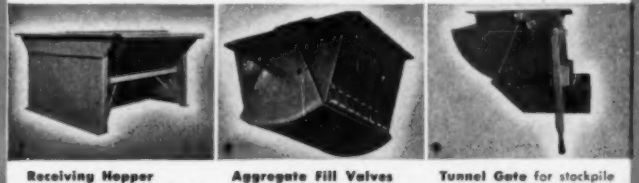
2-Way Elevator Discharge Valve, a flap-type chute, directs flow of cement to the storage tank.



Pivoted Distributer feeds aggregates to bin sections. Positions and locks by ground control wheel.

Bin Signals accurately register high and low levels in cement or aggregate. Dust-proof.

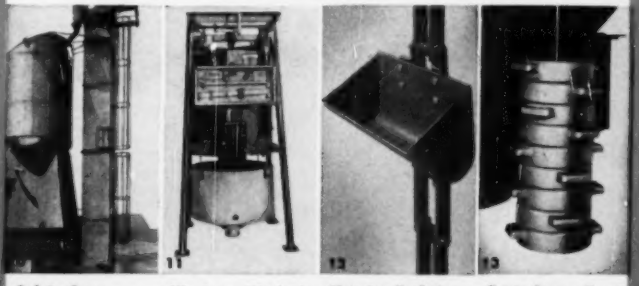
Rotary Plug Valve accurately controls cement flow. Plug operates freely in self-aligning bearings.



Receiving Hopper 30 and 50-bbl. sizes, feeds bulk cement to elevator. All-welded, weather-proof.

Aggregate Fill Valves single clam, radial type for jam-proof closing. Hydraulic pressure lubrication.

Tunnel Gate for stockpile reclamation. Single radial clam. Skirt board is hinged, opens and locks securely.



Safety Cage of 28" steel, welded to casing, can be furnished with all Johnson elevators.

Water Weigh Batchers, semi- or full-automatic types. 120 and 240-gal. sizes available.

Elevator Buckets in many sizes for aggregates, and cement. **Steel Chain** has carburized knuckles.

Batcher Test Weights in sets of nine, 50-lb. calibrated units, and two 25-lb. steel hangers.

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X1

Excavating Engineer
founded 1905 · DECEMBER, 1952

• Caterpillar DW-20 is push loaded on Utah highway construction. Job's batch plant is in background.

Modern Expressway — Utah Style

by Ray Day

The "Everlasting Hills" at Salt Lake City are gouged, graded and pulverized as Parsons & Fife move muck with heavy equipment.

ON July 20, 1849, Brigham Young and a band of Mormon pioneers came out on the lookout point at the mouth of Parley's Canyon, overlooking what is now Salt Lake City, Ut. History has it that the Mormon leader, ill in a wagon bed, raised himself on an elbow and exclaimed "This is the place!" Then the party picked its way down from that point across the sagebrush desert to the site of the city.

From that time since, travelers from Parley's Canyon into the beautiful city at the crossroads of the west have had somewhat of a problem. All the early roads and trails were bad. When the automobile age came, the situation became progressively worse, in spite of the fact that transcontinental highway U. S. 40 was built through Parley's Canyon.

A contractor, dirt moving equipment, and engineers of the Utah State Road Commission are again trying to solve the traffic problem. This time they have drawn up a modern multiple-lane divided expressway, which cuts straight as a die from Fourth South and 13th East streets, extends in gentle curves out through Fort Douglas, and ends at the mouth of Parley's Canyon near the point where the pioneers first saw the site of the city. The project is one of several now underway in the state to bring Utah's metropolitan accessways up to modern standards. Parsons & Fife Const. Co. of Brigham, Ut., has the $540,000 contract.

The 4½-mile job will re-route U. S. 40 over a new, straighter location into the city. It is expected to relieve one of the worst traffic bottlenecks in Utah by the time it is ready for traffic Sept. 15, 1952. In six months, Parsons & Fife expect to grade the new roadbed, move 140,000 yards of excavation, produce 83,000 tons of crushed gravel,

• Top: Looking down in Pioneer rock plant, we see Caterpillar D8 dozer push raw material to trap. Ford trucks take crushed material from surge bin. Above: Here is mounting of International UD-24 Diesel power unit which drives main plant.

32,850 tons of plant mixed asphalt surfacing, and 7,150 tons of chips for the armor seal coat which will cover the highway.

The job has several features of interest, including the waste of most of the excavation. How Parsons & Fife learned to move bigger payloads on smaller trucks at less maintenance cost will also be detailed.

Utah's engineers have designed the job to standards exceptionally modern for this mountainous state. Typical sections consist of 55 feet of paving, with a 3-ft. curb and gutter of concrete on either side. The pavement, which consists of 1 and 2-in. thicknesses of plant-mixed asphaltic concrete, sets on a granular sub-base course of crushed rock from 7 to 9 inches thick. Below this sub-base course, 95% densities are designed for the subgrade. Drainage is absolutely positive, to minimize any possibility of subgrade saturation. In fact, the drainage features are some of the most carefully designed of the project.

The 55-ft. paved width will provide plenty of room for 4 traffic lanes. These will be separated by median strips, dividing esplanades, and painted stripes. There are several modern traffic channelizations in the project to train cars in and out of the expressway. The completed highway is expected to handle 40,000 cars per day with ease.

The excavation of 140,000 yards of material for the new highway is somewhat unusual. To start with, a beautiful piece of location work moved the highway over to the flattish lowland which borders the Wasatch mountains, thus reducing the amount of material which would have to be moved. By obtaining permission to waste this ma-

terial as fill within the Fort Douglas military reservation nearby, the engineers eliminated much balance point figuring. Generally speaking, the scheme consists of cutting a roadway grade into the hills with a minimum of deep cuts or fills. And they have done this with maximum grades of 3%.

Since this scheme threw the haul of material on the long side, Contractor Parsons of the company selected long-range rubber-tired equipment, consisting of three Caterpillar DW-20's. A new D8 was brought in as a pusher tractor, two No. 12 Caterpillar motor graders were assigned, and a sheepsfoot roller with a Case tractor for towing power was brought in. Water equipment selected was mounted on Studebaker and White trucks, one unit consisting of a 3,000-gal. and the other a 5,500-gal. tank.

This equipment was unable to work in many sections, however, until utilities were relocated and a considerable amount of concrete curbs torn out where the new location crossed the Fort Douglas military reservation. Water lines, gas lines, sewers, electric and communications cables lay in the grading path.

The company owns a Michigan dragshovel, which was brought in to dig some of the utilities out for removal. When more equipment was needed, a Bucyrus-Erie 20-B dragshovel was rented, and assigned to the tough job of breaking out the concrete curbs and pavements which lay in the highway's path. This material was all removed without shooting or using a breaking ball. It was loaded out to a fleet of Ford F-6 trucks, and hauled away to a disposal area.

• Bucyrus-Erie 20-B dragshovel unloads 36-in. concrete pipe from Mack transport. Pipe sections came from plant at Pocatello, Ida., and are being installed for water supply line.

• Contractor J. B. Parsons poses for camera beside his Pioneer 46-VE Duplex rock plant.

The contract also called for the laying of a sizable section of 36-in. concrete water main. The Michigan and Bucyrus-Erie dragshovels teamed up on this assignment, with the Michigan digging the trench and the 20-B unloading pipe and placing the 3-ton sections in the trench. Concrete pipe was trucked in from a manufacturing plant in southern Idaho. It was easily installed and laid watertight by aid of a patented rubber gasket in each joint.

As the dragshovels finished their work and moved on, the DW-20 fleet came in to make a finished roadway grade. The material has turned out to be a mean mixture of stiff clay, gravel, and large granite boulders cemented in stiff clay. By using a pusher tractor, however, the No. 80 scrapers behind the DW-20's were able to pick up even the boulders. Two of the scrapers have been built up with sideboards so they will hold 18 yards level, or 23 yards heaped.

Hauls for excavated material were up to 1½ miles long. Also, there had to be considerable selectivity in grading, since the military officials at Fort Douglas did not want to import the rocky material laden with big boulders. The boulder-studded part of the excavation was disposed of by hauling it to the mouth of the canyon, where there was a good dump ground handy.

There were very few fills to be made. Where they did occur, the dirt was laid down in 6-in. lifts and rolled from 6 to 10 passes by the sheepsfoot roller, cuts—and most of the roadbed is in cuts—required special treatment. The grade was cut 2 inches low at the first excavation stage, then the subgrade was sheepsfoot rolled, and then the 2 inches of material was replaced with the aid of sheepsfoot and rubber-tire

rollers. Density checks were made to make certain the finished subgrade will measure up in every respect for workmanship and bearing value.

A double shift, 6 days a week, rolled the grading out between the 15th of March and the 1st of June. Parsons & Fife use a staggered system of hours to get the most out of their equipment. For example, one man arrived 20 minutes before the first shift went on to warm up the engines of equipment. At the end of 7½ hours of work for the first shift, the second shift reported for work. This placed two operators, a mechanic and oilers with each machine. Repairs could be made under this system before any trouble developed. And there was enough help there to get this done.

Interesting Crushing Job

As traffic gets heavier, with more frequent heavy loads, highway engineers must consider the base courses underneath the pavement more and more. These base courses cushion a heavy load, and transmit the loading forces over a wide area. For many years, due to the lack of highway money, Utah had to forget base courses and try to pave as many miles as possible with little or no protection underneath. Naturally, when traffic began to roll over under-designed highways, maintenance costs were excessive.

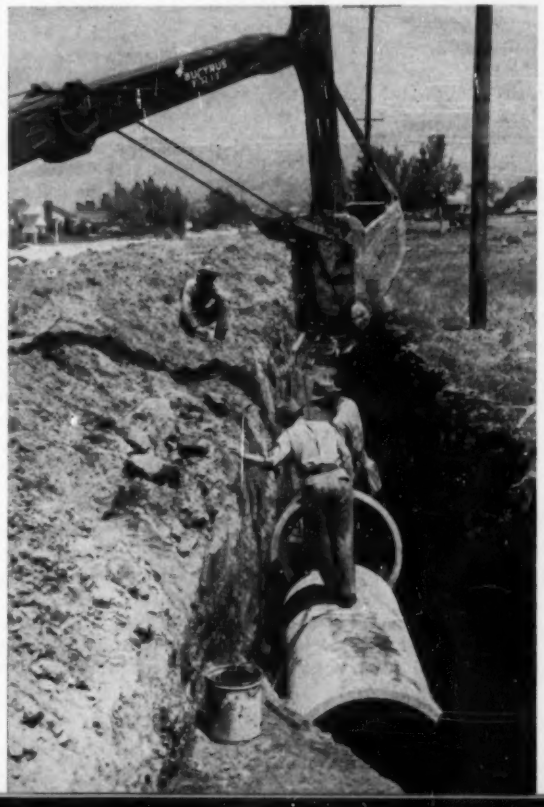
The design engineers on this project have attempted, within economic limits, to reverse that trend. As a result, the production and laydown of the crushed base material is a feature of interest not only to Parsons & Fife, but to other contractors engaged on similar work.

The specifications for base course material call for a 1-in. maximum size, well graded down through the fine screen sizes but low on the minus 200-mesh size. From 45 to 65% of the finished material must pass the No. 4 screen, and from 35 to 55% must pass the No. 40 screen. The limits on minus 200-mesh material are 2%.

These specifications were designed to produce a fine, strong granular base, with a great deal of particle interlocking capacity. The generous amount of minus No. 4 and 40 material was put into the material to fill in the voids and make a dense but flexible mat. By the very nature of the specifications, however, a problem in crushing was created.

The pit from which the raw material is being taken is situated south of the mouth of Parley's Canyon, about 2¼ miles on a dead haul from one end of the job. It is the site of a former location where the county produced gravel. The site is near one of the benches or escarpments of ancient Lake Bonneville, which once covered all of Salt Lake City and Provo. It consists of a bedded alluvial deposit of granite boulders, hard rock, sand and gravel. To produce 1-in. minus material from this deposit, it was necessary to crush better than 50% of the rock fragments.

Parsons & Fife have a Pioneer 46 VE Duplex rock plant, which is powered by an International UD-24 industrial engine and a 50-kw International Diesel electric generating set. At first, to meet the grading specifications, the 20x36 roll crusher on the plant was set with a clearance of ½ inch. Tests made on the material showed that rock dust being produced by the excessive crushing was boosting the fines content above specification limits. The Pioneer plant has adjustments which are quick and easy to make, so the plant operator squeezed the jaw crusher down just a bit and opened the secondary rolls to ⅝ inch. The adjustment pulled about 1½% of



• Bucyrus-Erie 20-B dragshovel places concrete pipe section in ditch which 20-B has just dug.

● Left: Man uses tapeline to stake out distance loaded truck must cover in spreading sub-base material. Right: Heavy granular sub-base is dumped in heavy windrow by one of Ford F6's on project.

minus 200 material out of the mix and brought it within specification limits. To help out, bedded clay seams were shoved aside from that point on by the D8.

From a contractor's point of view, the set-up is simple and efficient. Instead of mounting the UD-24 engine and the International generating set on skids, Parsons & Fife purchased a used heavy duty trailer, which can be towed by a transport truck. Both of the big Diesels were mounted to the floor of this trailer, and the body members strengthened. On this set-up, which happened to be rather high on a hillside, a level place was quickly scooped out by the dozer which feeds the plant, and the trailer was moved into position. Fir timbers between the trailer frame and deadmen buried in the ground take any thrust which develops when the flat belt drive starts the Pioneer plant.

Another interesting problem in job haulage was whipped when Utah, last year, went to rigid enforcement of an 18,000-lb. axle load limit. At that time the company had Ford F8's and International KB-11's. These were big, heavy-duty trucks, built to haul enormous payloads. But the new highway restrictions cut down the load which could legally be hauled to something like five tons.

The company studied the situation, and recently purchased a fleet of 10 new Ford F-6's. These trucks are smaller and lighter, but they are so built that an 8¼-ton payload can be hauled each trip. In addition, the maintenance and operating costs is less. The Ford F-6 fleet is working out very successfully.

Raw material from the pit is shoved a maximum of about 450 feet by a new D8 Caterpillar-mounted dozer, the material rolls down to the receiving trap, which admits it through the roof of a 10-ft. Armco pipe culvert. A Pioneer feeder with special drive sprockets to increase the input of material to the plant then takes over, and moves the rock to the conveyor belt which leads to the plant.

Portable Rock Plant

The Pioneer 46 VE Duplex plant brings the raw material in over a bottom screen deck, which quickly separates all the native material which will fall under the 1-in. size limit. This rids the plant of that load, leaving only the material which has to be worked on. It travels to a 10x36 jaw crusher, then to a 20x36 roll, and returns in closed circuit to the screen. Rock is ejected to the surge bin the instant it meets specifications, and all oversize material is held within the crushing-screen system.

The Parley's Canyon job is No. 3 for the rock plant. Last year on its maiden assignment, Parsons & Fife worked it in a heavy deposit of Snake River rock in southern Idaho. No more brutal punishment can be dished out to a piece of machinery, but the plant stood this job in fine shape, turning out an average of 1,750 tons in 8 hours for the project. The size requirements were very much similar to the Parley's Canyon expressway.

The Ford truck fleet hauls from a 40-ton surge bin, set on a haul road which permits one way traffic without backing under the plant. Loaded trucks are weighed, driven to the job, and dumped very carefully according to the volumetric requirements of the sub-base course. After the right amount of crushed rock is dumped in place, it is roadmixed for several passes by the two Caterpillar No. 12 motor graders. Roadmixing blends the material, giving a good gradation from fine to coarse particles. If necessary, water is added when the roadmixing is under way. When this manipulation is complete, the material is laid down by cutting segments out of a windrow laid on the quarter point. The thin lifts are rolled by a Case-drawn rubber-tire wobble wheel roller.

The sub-base is finished off by tight blading with a motor grader, as surveyors check levels and set final grade stakes. One of the secrets of a smooth highway is a velvet-smooth sub-base, and the field crews are making every attempt to get it.

Most of the equipment on this project is so new the paint is still almost

• Two Caterpillar No. 12 motor graders march in a row as they roadmix windrow of crushed rock for sub-base on new highway.

wet, so the preventive maintenance program of Parsons & Fife is set up to keep it that way. The company has been in business for a considerable length of time, and knows that effective preventive maintenance pays good dividends.

At the Brigham headquarters, the company operates a main shop which takes care of winter overhauls in December, January and February. Major service is also taken care of at headqu rters when equipment is on a job near Brigham, but repairs are also made in the field, if necessary.

Shifts are operated on all equipment to bring the operator, a helper and mechanics together at least once a shift. For example, crusher adjustments and minor repairs are made before major damage occurs. One of the DW-20's had a bad tailgate adjustment, so the gate failed by several inches to roll back against its stop. The operator, grade foreman and master mechanic took advantage of a rainy morning to repair it.

Pennzoil lubricants are standard for all machinery, and a representative from the Pennzoil Co. has made recommendations which are being carefully followed. There is a manufacturer's instruction book at every field spread; often on every machine in the tool box. They are not filed away in the front office. Manufacturers' requirements are being strictly observed, and in some cases exceeded. For example, oil is changed oftener than every 60 hours if the weather is dry and dusty.

In addition to this observance of manufacturer's recommendations, Parsons & Fife are trying to tie equipment conservation up with a safety program. Operators are never encouraged to take chances, to put scrapers in dangerous positions on slopes, or to bull tractors through nests of tough boulders which all too often have a way of splitting a final-drive case wide open. In spite of some rough formations which call for all the horsepower in the machines, they are being operated safely and with very little repair.

Excellent progress is being made on the new expressway, and by the 15th of September it is expected to take its place in the new Utah highway system planned for the present and future. Utah highway officials are attempting to achieve a nice balance between planning, financing and executing various highway projects to use federal aid funds as rapidly as they are allocated. It has not always been possible to do this, but the new expressway represents success in this objective.

The project, known by its federal aid number of U164-(4), was designed and is being supervised under chairman D. H. Whittenburg of the Utah department of engineering. E. G. Johnson is chief engineer of the commission, and J. Q. Langford is construction engineer.

For the contractor, J. B. Parsons of the company is spending a great deal of time personally supervising the work. Robert Phillips is general superintendent, Donald Jackson is grade foreman, Walter Jenkins is master mechanic, and Robert Fulkerson is office manager.

Machine-Gun Camera Aids Blasting Studies

In this study based on photographic evidence, the author presents several theories and facts regarding blasting action. Sequence photography by machine-gun camera lets us see exactly how blasts move material.

by John L. Romig
Asst. Mgr., Technical Division
Atlas Powder Co.

THE use of sequence photography in studying explosives action has made possible the verification of a number of theories which have always been considered extremely debatable.

Sequence photography differs from movie photography. Movie cameras take from 16 to 60 frames a second on extremely small negatives. Normal exposure time is 1/100 to 1/200 second for each frame. The machine-gun camera which is used in sequence photography takes only three photos a second, but these are on a 5x5 inch negative and each exposure is 1/450 second. The large negative and fast exposure time mean that each stage of a blast can be seen with complete clarity and

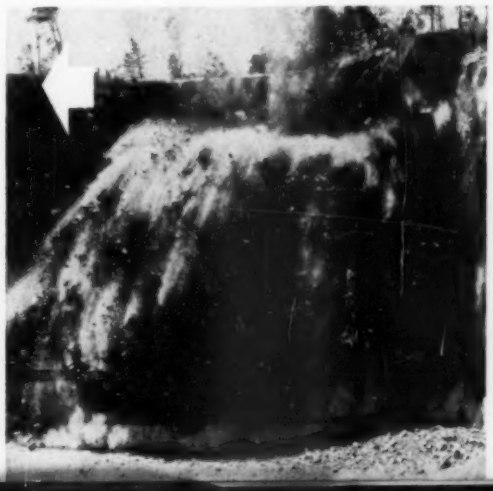
• The machine-gun camera photographs on these two pages show a quarry blast initiated at the top of the holes. The sequence begins in the upper left hand corner of the opposite page. Although the blast was stemmed as adequately as possible, note that there is still considerable escape of explosives gases at the top of the holes. In contrast to other sequences showing bottom initiation, you see here that the top of the burden gets far greater force than the bottom. Close inspection fails to reveal any great movement at the bottom.

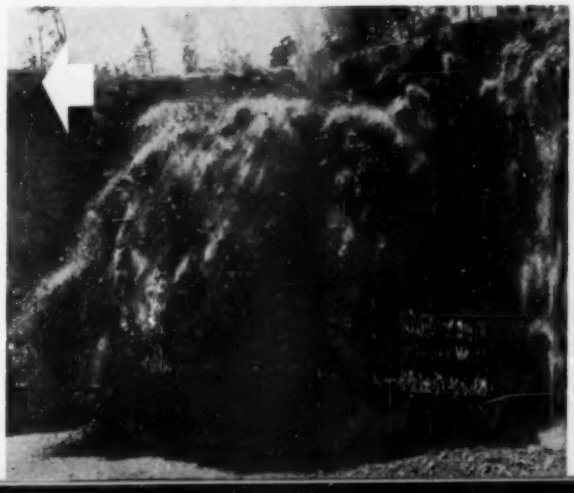
the details of the action can be thoroughly studied.

One theory of blasting which has been verified by the machine-gun camera is that the point of initiation *does* influence the point where the rock movement is started.

It has often been held that the velocity of dynamite is so fast that the detonation in a blast hole could be considered as instantaneous. In other words, with caps either in the top or bottom of the hole or with detonating fuse providing the initiation, the contention was that the movement of the rock would be essentially the same.

Evidence in the sequence photographs shows that this contention is incorrect. Sequences of blast initiated





• Left: Photo, taken one-third of a second after initiation at the top of the holes, clearly shows that rock movement is influenced by point of initiation. Action along top of the burden is plainly seen while there is no movement at the bottom.

• Right: These three photos show another blast initiated at the top of the hole. Since initiation was at the point of least resistance, plenty of gas was allowed to escape. Much of the top rock followed this line of least resistance. Although the throw here is not considered excessive, it is still more than necessary. With this release given, the explosive could not exert its full strength on the rock at the bottom.

at the top of the holes have been compared with blasts initiated at the bottom. Invariably the blasts initiated at the top of the holes show rock movement at the top of the burden before movement at the bottom, and during the sequence the top part of the burden remains ahead of the bottom in outward and downward displacement. Where initiation is at the bottom of the holes, the first rock movement can be seen at the bottom and, in contrast, the bottom moves out ahead of rest of burden and holds its lead during the downward fall.

Better Confinement

The sequences of photos have gone on to show that the point of initiation has a definite effect on the degree of confinement in the blast.

Despite the fact that the bottom of the blast hole is obviously the point of maximum confinement and therefore the logical place to initiate a blast, it has often been held that equal confinement could be achieved with initiation at the top of the blast hole and that, in any event, the waste of explosives gases was not significant.

The pictures, however, tend to bear out the theory that maximum confinement can be achieved with bottom initiation. All the photos of blasts initiated at the top of the holes have shown loss of confinement, as seen by the escaping gases. This loss of confinement usually results in poor rock fragmentation and often in greatly increased air blast. The latter gives rise to many blasting complaints. Blasting complaints may cause property owners to have drastic restrictions on blasting procedures invoked.

Photos of blasts in both quarries and stripping operations where the blast holes have been initiated from the bottom have proved with good drilling, loading and stemming, proper confinement of the blast can be accomplished. When such procedure is followed the material is displaced fully before there is any escape of gases, thus making the explosives do their most efficient and least costly job.

When a blast is initiated from the top (or, in the case of a horizontal hole, from the front) it is quite common to see the escape of explosives gases. This may be attributed to the

• In the alternate Rockmaster Blast shown in these six sequence pictures, the advantages of bottom initiation are quite apparent. Prolonged confinement of the explosives gases not only eliminates air blast but allows the full power of the explosives to be exerted on the burden. Outward rock movement begins at the point of initiation and the bottom leads the top throughout the action. Excellent fragmentation resulted.

fact that the detonation is started at the point where the confinement is the poorest.

Pull the Toe

Closely related to maximum confinement of a blast is the problem of keeping free of any "toe." A comparison based on top vs. bottom initiation of a blast gives visual evidence of the effectiveness of each method. The series of photos showing a blast initiated at the top of the holes discloses geyser-like escape of explosives gases. This type of blast results in noise along with resulting complaints of property owners. The blasted material in the top-initiated blast has a tendency to move upward as the detonation of the explosive charge progresses down the drill hole; thus when the detonation reaches the bottom of the hole you find the usual cone shaped projection.

The photos showing bottom initiation of the explosives charge shows no evidence of escaping gases; therefore the noise of the explosion is trapped

• A stripping blast is initiated at the bottom of the holes. Note confinement, lack of air blast and controlled heave. Final photo shows excellent breakage and displacement. Confidence of this contractor in the control of his blasting is demonstrated by the proximity of shovel and drill to the blast area. Until confinement through millisecond-delay methods was introduced, this general area had a critical complaint situation with the town in background. But with air blast reduced by proper confinement and millisecond-delay arrangement, the sound of blasting does not attract attention. Sequence goes from left to right in both lines of pictures.

and muffled. The point of initiation shows shearing at the quarry floor. This shearing action results in the absence of a toe condition.

The studies made with the machine-gun camera have enabled the detection of objectionable and acceptable features in blasts. Insufficient stemming can be detected. Drilling patterns showing incorrect burdens and spacings are readily sho[illegible]. Excessive throw or properly con[illegible]d blasts are recorded by the camera.

Confinement Pays

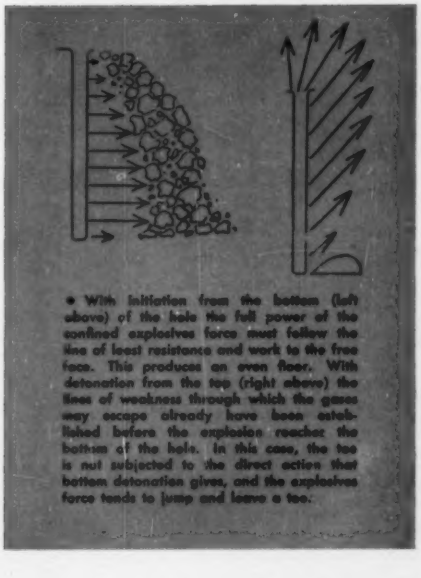
It is generally agreed by experienced blasters that explosives energy should be confined as thoroughly as possible if (1) blasting costs are to be kept at a minimum, (2) rock breakage is to be kept at a maximum, and (3) blasting vibrations are to be kept at a minimum. Ground and air vibrations are frequently called the No. 1 Public Relations Problem for quarrying and stripping operations.

During this study it has been and still is our objective to obtain as many different sets of pictures as possible on all types of blasting methods. These methods may be listed as follows:

1. Detonation from the top with detonating fuse.
2. Bottom initiation.
3. Instantaneous blasts.
4. Fast delay blasts (a) in sequence, (b) used alternately.
5. Effects of different fast delay timing.
6. Effects of slow vs. fast dynamite.
7. Comparison of results under each method.

Milli-Second Delay Advantages

Improvements in the technique of using milli-second delays in overburden blasting are developing steadily. As a result the trend today shows startling increases in the practical ap-



• With initiation from the bottom (left above) of the hole the full power of the confined explosives force must follow the line of least resistance and work to the free face. This produces an even floor. With detonation from the top (right above) the lines of weakness through which the gases may escape already have been established before the explosion reaches the bottom of the hole. In this case, the toe is not subjected to the direct action that bottom detonation gives, and the explosives force tends to jump and leave a toe.

plication of this modern method of detonating explosives force.

But full utilization of this method or any other improved methods will depend on how much attention and study is given to their proper application. An active interest in blasting techniques and results is important and should be followed closely.

It has been definitely established that, properly applied, milli-second delays can provide the following advantages:

1. *Better fragmentation.* This not only means faster digging but also less wear and tear on equipment.

2. *Improved displacement.* It is not uncommon to get reasonably good fracture and not have sufficient displacement. The lack of displacement may result in slower digging.

3. *Reduced vibration and noise.* This has been documented by seismograph tests and is equally true of either progressive or alternate methods of milli-second-delay shooting.

4. *Controlled throw.* Both the extent and direction of throw can be influenced by the delay periods used.

5. *Reduced backbreak.* Reduction of backbreak in vertical hole shooting permits starting the next row of holes in the desired area.

Firing holes in sequence has been said to result in decreased blasting vibrations. In the past this has been widely accepted. Recently a study on blasting vibrations in Sweden has indicated that less vibration may occur when fast delay electric blasting caps are used alternately.

It is hoped that these advantages, constantly being proved in pictures by the machine-gun camera, can be accepted as a challenge to all of us to get the most out of explosives energy in all types of mining and quarrying. Increasing attention to blasting technique can bring this much desired goal nearer.

Chicago Sewer Job Heralds Deeper Open-Cut Construction

A 40-ft. deep trench, 17 feet wide at the bottom, was needed to cast-in-place big sewer on Chicago's south side. M. J. Boyle & Co. went to benched cuts, big dragshovels and draglines to keep job moving at fast pace.

ON Chicago's far south side, veteran contractors M. J. Boyle & Co. put down $2,034,180 worth of large-diameter sewer this past season. It is reported to be the deepest open-cut sewer installation ever attempted in the Windy City. Despite the unusual depth of the job, the Boyle forces succeeded in turning it out almost on a production line basis.

Effective placement of excavators and thoughtful use of front-end equipment enabled them to achieve this goal. The construction site took in about four city blocks at a time as it progressed from opening the ditch to backfill. Within this stretch, the superintendent spotted from seven to nine excavators. Their places in the line of march were changed from time to time to best meet the changing depth of the work. Three types of front-end equipment — dragline, dragshovel and crane—were assigned to the machines. Conversion on the job was common when it became apparent that one type of machine would turn out the particular operation faster than another.

Officially, M. J. Boyle's contract with the City of Chicago was called Auxiliary Outlet Sewer, Beverly-Calumet, Contract No. 3-A. It proposed the construction of 8430 feet of 13-ft. 6-in. by 15-ft. saucer-based oval sewer, cast-in-place. Depths ranged all the way down to 40 feet at the subgrade excavation.

Plan for Production

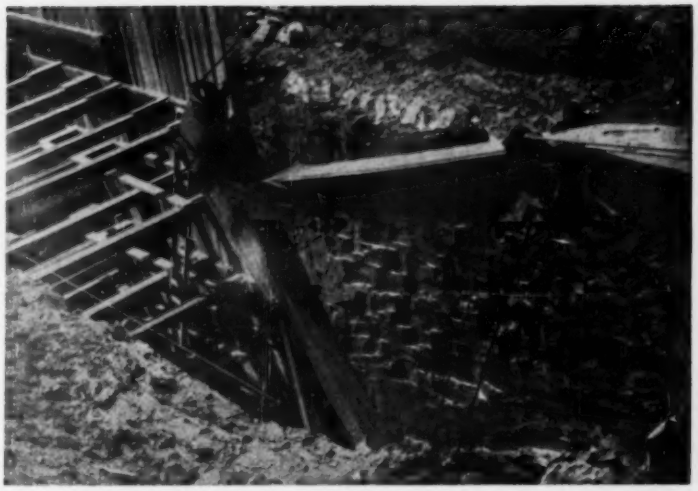
M. J. Boyle & Co. superintendents like to set up their jobs so the least amount of improvising is needed when the work is done. They think it better to put on more equipment and be able to count on a regular rate of progress each week than to under-equip the job and be constantly devising ways

to handle out-of-the-ordinary phases as they come up, thus slowing down the work. Experienced Superintendent R. J. Gross, Jr. follows this mold. When he was assigned the big sewer job shortly after the company won the contract last spring, he made plans to equip his production line.

The project seemed to fall into three sections according to depth of excavation. The first 2800 feet started at Laflin Street and ran east along 110th Place. This footage required an excavation 40 feet deep from street level to subgrade. The width of the cast-in-place invert, and hence the trench bottom width, was 17 feet.

To station excavators with this range along house flanked streets presented an interesting problem. Superintendent Gross decided to dig the cut in benches with one excavator relaying the dirt to another. The contractor handled the first half-mile of excavation in this manner.

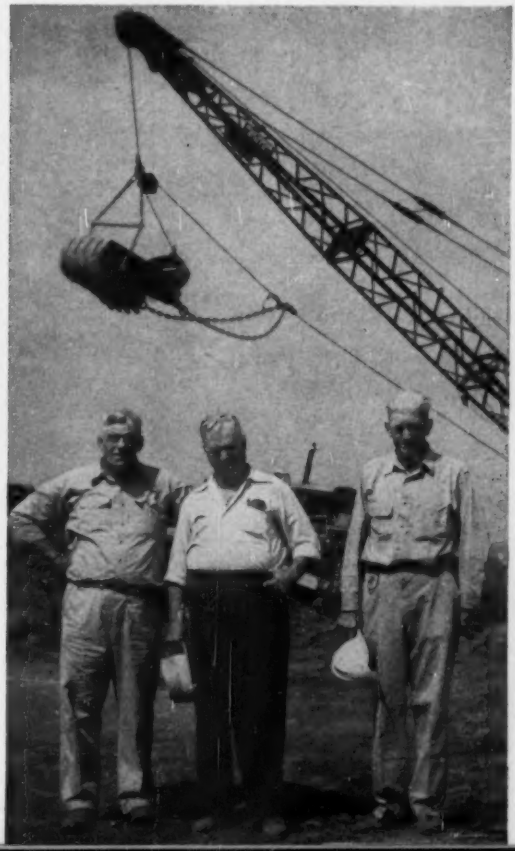
To begin with, they took a 12-ft. cut out of the street. Excavation sides



• Dragshovel on lower bench cuts perfectly vertical trench sides with fan-type side cutters attached to 2½-yd. dipper.

• Lower left: Three Bucyrus-Erie dragshovels dig 40-ft. ditch on M. J. Boyle & Company's south side job for City of Chicago. Machine in hole is Bucyrus-Erie 54-B dragshovel which digs vertical-sided trench 17 feet wide and 28 feet deep. It passes dirt back to Bucyrus-Erie 51-B dragshovel just to left. At right of 54-B is Bucyrus-Erie 38-B dragshovel which digs most of 12-ft. stripping cut.

• Lower right: Three top men who keep the M. J. Boyle contract moving at production-line clip: (left to right) W. J. Callahan, assistant superintendent; R. J. Gross, Jr., superintendent; T. M. Fitzpatrick, assistant superintendent.



were sloped from a width of 42 feet at the top to 28 feet at the bottom. A 1½-yd. Bucyrus-Erie 38-B dragshovel backed down the line of excavation, taking out the asphalt paving and most of the initial cut. It received some assistance from a Bucyrus-Erie 51-B 2-yd. dragshovel. The 51-B also shaped up the bank opposite the 38-B. Its main duty, however, was to load into trucks the material which was excavated by the big dragshovel at the cut bottom.

In the cut, the contractor spotted his long-range Bucyrus-Erie 54-B 2½-yd. dragshovel. This machine was a new departure as far as range and capacity were concerned when the Boyle organization first used it on the Kostner Avenue outlet sewer in 1950. (See "Big Dragshovel Speeds Deep Sewer" in September, 1950, *Excavating Engineer.)* In the intervening two years, the 54-B had proved itself an invaluable tool for handling deep, close-quarter work. At the lower level, the big dragshovel took out a cut 28 feet deep and 17 feet wide. The difference between the 28-ft. width at the bottom of the first cut and the 17-ft. width at the top of the second cut allowed walking space for the men and operating room for the machine.

Dipper Trims Cut

The sides of the deep cut had to be perfectly vertical. The 54-B dragshovel trimmed these as required with fan type blades attached to the sides of the dipper. The machine also did an excellent job of trimming the bottom of the ditch, leaving very little, and often no hand work to be done.

Since the 54-B operated 12 feet below street level, it was impossible to load directly to trucks or to spoil pile. The machine dumped the material in the ditch behind itself. Here the 51-B picked it up and relayed it to trucks.

In completing this section of the sewer, the 54-B in the ditch had to swing 180°. The boom had to be raised to full height in order to keep from scraping the dipper along the ground. In spite of the delicacy of the operation, cycle time was good—about 50 seconds.

As soon as the 28-ft. depth was cut and trimmed, it had to be shored.

• Going into the second phase of the sewer job, the contractor found ample room to swing draglines. In this 3500-ft. section, subgrade depth gradually rose from 40 feet to 31 feet. Two draglines stripped the first ditch. In the ditch, the Bucyrus-Erie 54-B long-range dragshovel put down the finished trench. It passed dirt to the 51-B, now converted to dragline. The 51-B passed it out to a Bucyrus-Erie 38-B dragline which stockpiled the dirt at the side of the excavation.

Ground condition throughout the job was too soft to maintain the deep cut more than a few minutes. Shoring followed so closely that the 54-B operator needed to exercise great care to keep his dipper from disturbing in-place braces.

On the first and later sections of the job, the top strata of excavation was found to be a thin layer of sand. It extended from three to 10 feet down. Underneath the sand were three layers of clay labeled as follows on the specifications: stiff blue clay, tough blue clay and very tough blue clay. In practice, most of the lower portions turned out to be a hard silty clay. As soon as moisture hit it, it disintegrated. For this reason, the deep cut was shored all the way down.

The bottom eight feet of shoring placed in the 27-ft. cut were wasted. The planks were left in place when the pour was made and, of course, this meant added expense to the contractor.

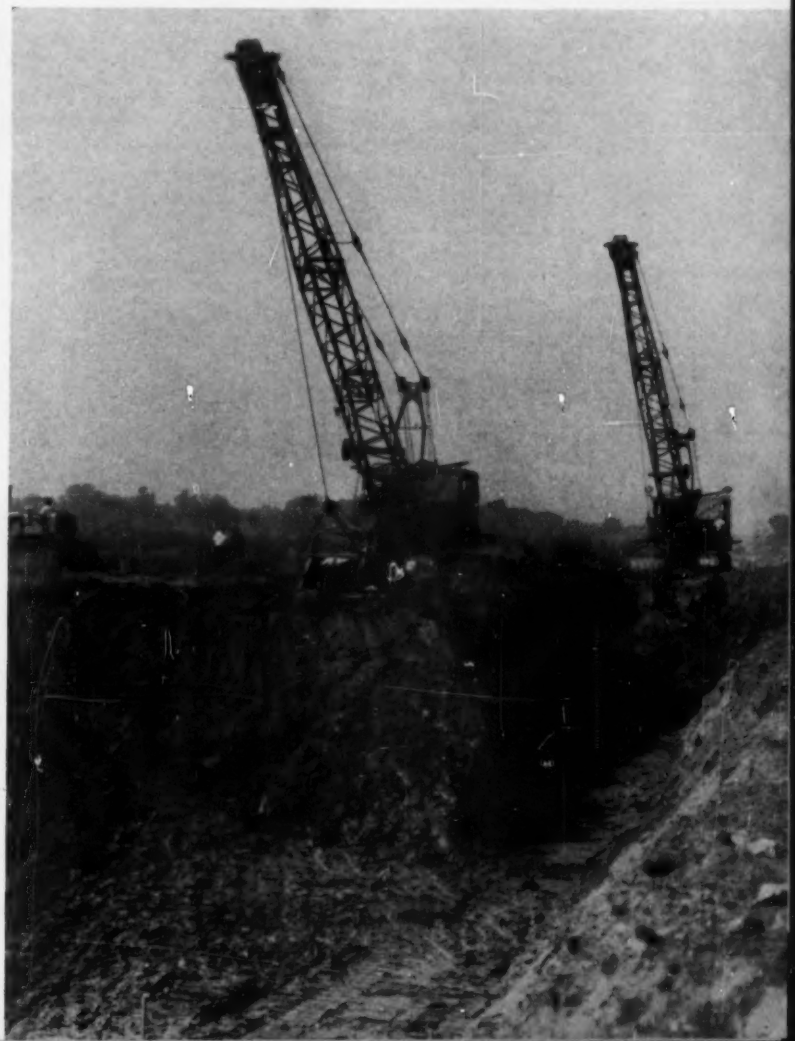
The deep cut's upper shoring was partially pre-fabricated above ground. Two 6-in. by 8-in. by 12-ft. whalers were bolted to three pieces of 3-in. by 8-in. by 20-ft. sheeting. This was called a set and a Bucyrus-Erie 22-B crane lowered it into the excavation as a unit. Once in place, additional 3-in. by 8-in. sheeting was slid into place behind the whalers by workmen. Cross braces were made of 8-in. by 8-in. timbers. The sets and sheeting thus inserted were later pulled with another Bucyrus-Erie 22-B crane.

Pour Through Two Lines

The sewer was poured in three sections. First the invert was formed, then the sides and finally the arch. Two Rex 8-in. Pumpcretes moved the concrete from hopper to forms through about one city block of 8-in. pipe. The pumps were double-acting, keeping the concrete in motion on both strokes. With two pumps, it was possible to pour two sections at a time; for example, invert and arch. Blaw-Knox telescopic steel forms were used to shape the barrel and they were moved along as the pour progressed.

Rex Moto-Mixers mounted on a variety of trucks brought the ready-mix to the job from two suppliers: Material Service Corp. and Allied Con-

• Bottom left: Workmen insert 3-in. by 8-in. sheeting behind "sets." Below left: Note how closely shoring follows dragshovel boom. Line of sewer was making 90° bend from 110th Place onto Morgan Avenue. Above dragshovel, an Allis-Chalmers HD-19 crawler with Tracto-Motive front end loads surplus dirt to truck for haul to disposal area. Below right: Two Bucyrus-Erie 38-B draglines take out the stripping cut. Crawlers with bulldozers helped shape stockpiles built up by draglines.

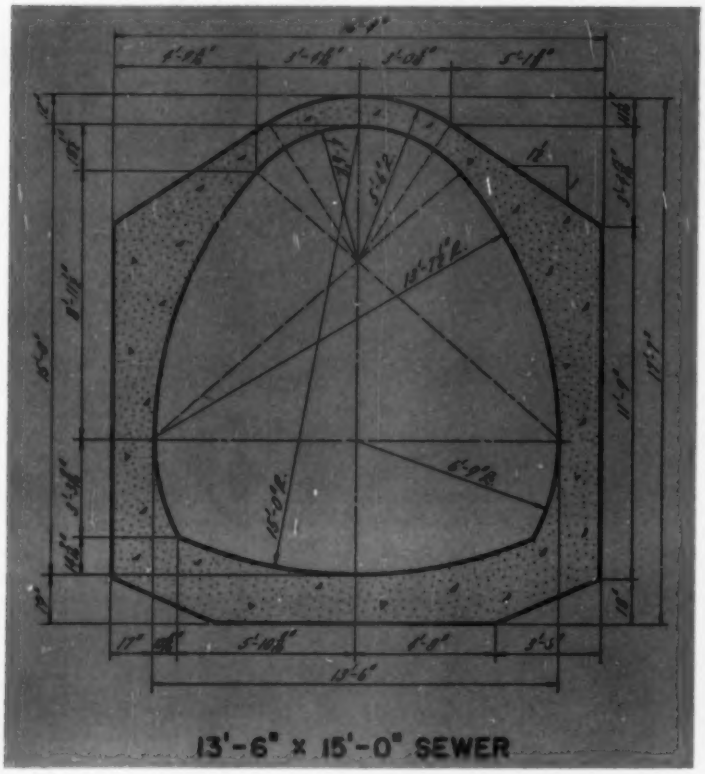


crete. The trucks backed onto elevated ramps and discharge to pump hoppers. Concrete volume on the first section ran about 3.4 cubic yards per lineal foot.

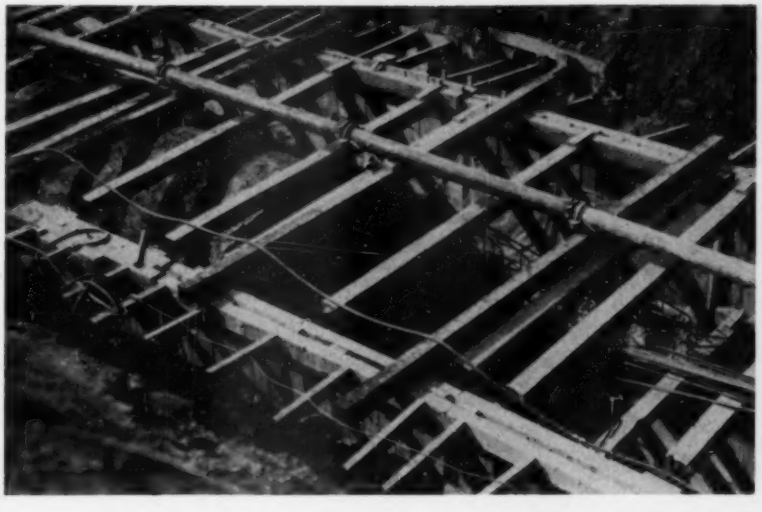
A fleet of thirteen 8-yd. six-wheel trucks hauled surplus excavated material to a dump. Three Hendricksons and 10 Whites made up the fleet. An abandoned clay pit at 119th and Wood Streets served as disposal area. Only the amount of clay which was displaced by the concrete sewer was discarded. The rest was stored for backfill. Haulaway averaged about 10 cubic yards per running foot of sewer.

The preceding operational procedure was followed in constructing the first 2800 feet of the sewer which ran along 110th Place from Laflin Street east to the Panhandle Branch of the Pennsylvania Railroad, a freight transfer line. Only this section necessitated a 40-ft. cut. On the following two sections, the depth of the job became less.

• Below: Here is typical section of cast-in-place sewer as installed by M. J. Boyle & Co. Trench bottom acts as bottom form and shored sides serve as side form. Right: Bucyrus-Erie 22-B crane lowers prefabricated set into trench. After cross braces are secured, workmen slip sheeting in behind whalers.



The Boyle crews were next confronted with 3500 feet of sewer running along 110th Place to Morgan Avenue and thence north on Morgan to 106th Street. It was this section of the sewer they were building when *Excavating Engineer's* representative visited the project. The subgrade here gradually rose from a 40-ft. depth to a 31-ft. depth. In this section, Superintendent Gross assigned two Bucyrus-Erie 38-B draglines to work at the street level. The line ran through an open field, affording ample room for long-boom front ends of the dragline type. These two dug the initial cut from 11 to 18 feet deep. Most of the material was stockpiled at the sides of the cut. Working in the cut was the 51-B which had been converted to a dragline. It trimmed the initial cut and took material passed back by the 54-B dragshovel and passed it on to a 38-B



• Left. Close-up shows partly completed barrel which was poured in sections.

• First below: Bucyrus-Erie 38-B dragline builds stockpile of dirt. Most of it will go back in trench after sewer is completed. Displaced dirt is carted to dump.

• Second below: Caterpillar D8 with dozer blades spoil piles into shape. Another Cat in left background is also assigned to spoil handling task.

dragline equipped with a 2-cu. yd. light dragline bucket. The machine, standing at ground level, placed the excavated material in a stockpile alongside of the ditch. A Caterpillar D-8 dozer pitched in to help. The 54-B dragshovel again dug the remaining sewer trench, now about 20 feet deep. It trimmed and passed back as it had done in the previous equipment set-up.

The third and final section of approximately 2000 feet of sewer was a continuation along Morgan Avenue north from 106th Street to 103rd Street. Subgrade in this section rose in depth from an initial 31 feet to a final leveling off at 30 feet. Superintendent Gross cut his excavating operation down to two or three machines in this stretch where the streets were closely flanked by houses. The initial stripping cut was about 23 feet wide and only 3½ feet deep. The 38-B dragshovel handled this. It ripped up the pavement, excavated the shallow bench and loaded it out to trucks. The 54-B dragshovel excavated for the sewer, going down some 27 feet. Since it worked at a grade only 3½ feet below street level, the machine was able to load directly to trucks.

In the three sections of the job divided according to excavator alignment, excavation yardages varied. In the 40-ft. deep section, approximately 36 cubic yards of dirt were taken out per lineal foot of excavation. In the second section the average dropped to 33 yards. Because of the shallow subgrade, the average in the third section was only 20 yards.

A number of crawler tractors were

• Top: Two lines of ready-mix trucks line up to feed the 8-in. Rex Pumpcretes. Left: Block ramp helped feed concrete from Rex Moto-Mixer into pump. Below: Completed arch is revealed in foreground as workmen remove bracing.

also among the earthmovers on the sewer job. An Allis-Chalmers HD-19 with Tractor-Motive high lift worked at the spoil pile loading haul-away material to trucks. Also on this task was a Caterpillar D4 with Traxcavator front end. In addition, a D6, two D7's, and a D8 with dozer blades helped shape the cuts and spoil piles.

After the sewer was buried, it was wetted down thoroughly. It was jetted and saturated with water in ditches dug with a trenching machine and holes dug with an electric earth auger. The practice assured getting water down through all the backfill. Past experience has shown that jetting and trench saturation produce an exceptionally well-compacted fill. The contractor expected to finish the job, begun June 1, by the end of 1952.

Superintendent R. J. Gross, Jr., was assisted by two assistant superintendents, W. J. Callahan and T. H. Fitzpatrick. John LeFevour was project assistant to Superintendent Gross. Richard Gross was job engineer.

"EUC" SCRAPERS

Haul More Yardage At Less Cost

The "Euc" Scraper has a struck capacity of 15.5 cu. yds., 21 yds. heaped... 10 speed transmission ...275 h.p. engine...top speed, loaded, 28.2 m.p.h.

Four wheel Euclid tractor provides easy, positive steering, excellent maneuverability, and has ample power, traction and flotation for fast loading and travel on steep grades and soft fills.

Owners in all parts of the country report that the Euclid Scraper with a heaped capacity of 21 cu. yds., has outperformed other scrapers of comparable size on a wide range of jobs. As one leading contractor puts it, "The 'Euc' outhauled other scrapers, had less down time, and maintenance costs were about 50 per cent less." After completing a rush airport job, one with a wide variety of soils, another contractor stated, "We're glad that our choice was Euclid over all other makes of rubber-tired scrapers."

Because of fast, easy loading, high travel speed, good traction and flotation and excellent maneuverability, Euclid Scrapers move more loads per hour at more profit per load. Have your nearest Euclid Distributor give you complete information and job proved performance data on this Euclid Scraper—get more production at less cost!

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

CABLE ADDRESS, YUKLID. CODE: BENTLEY

TURNS with POWER ON BOTH TRACKS

SWINGS FULL LOAD WITH THE GREATEST OF EASE—a tight turn with a lift gives the TD-24 a chance to show off its power.

International Steering system helps "Big Red" —the TD-24—do more work in less time

What's the pay-off for a crawler tractor?

The most work done per day.

What delivers the pay-off?

Superior speed and power—and finger-tip steering to take advantage of that speed and power. Like this:

The operator of your Big Red TD-24 drops one track into low speed, and the huge crawler comes around, moving right along with its load, turning with power on both tracks!

The TD-24 makes gradual turns with power on both tracks, feathered turns of any degree, or pivot-turns—all with fingertip ease of control. Planet Power Steering lets the operator turn while pulling heavy loads and also maneuver in close quarters. That's why the TD-24 is the most versatile of all crawlers.

Add this to the TD-24's tremendous power —more drawbar horsepower than any other crawler on the market—and you get what you want: more dirt moved, more work done per day.

Isn't that reason enough to put the TD-24 to work for you? Especially when it's backed by your International Industrial Distributor's complete service facilities. Get the details . . . you'll be a TD-24 man from then on in!

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

INTERNATIONAL HARVESTER

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POWER THAT PAYS

TIGHT TURN WITH A BIG SCRAPER. "Big Red"—the International TD-24—pulls a big 25-yard scraper with a full load in close quarters on a road relocation job.

News from the Field

Five Year Road Plan Starts in Kentucky

"The most far-reaching plan in the history of the department of highways," was announced recently by Kentucky Highway Commissioner W. P. Curlin.

The plan consists of a five-year program listing federal-aid construction work on 800 miles of Kentucky's primary system at an approximate cost of $42 million. The program represents a year of surveys, plans, estimates, and coordinating work.

Field work on the five-year program was initiated with traffic surveys which were conducted over 2,500 miles of Kentucky's primary roads. Following the surveys, road estimates and evaluations from the local-field-condition viewpoint, were made by the district engineers. These figures and the traffic survey figures were coordinated in the office of the state highway engineer.

Four primary factors were considered: (1) traffic volume on the road; (2) restricted sight distances; (3) substandard curves, both horizontal and vertical, (4) roadway and pavement widths.

The final decisions, as to what construction work needed to be done and what roads would receive priority, were based on these considerations. Federal-aid work to be done on the primary system for 1952 was then decided.

At the end of 1952, the figures will again be studied, along with the surveys conducted through the year. Since the traffic patterns may change — so priority ratings on the various roads may change. Another year's program will be added at the end of each year perpetuating the five-year planning.

The program applies only to the federal-aid primary system. A federal-aid secondary program is contemplated but not in the near future. Urban roads with their variable traffic conditions are not included in the program.

Asphalt Institute Promotes G. H. Dent

Bernard E. Gray, president of The Asphalt Institute, has announced the promotion of George H. Dent to the post of division engineer, with supervisory duties over division "I" of the Institute's Field Engineering Staff. His office continues at Mills Building, Washington 6, D. C.

Division "I" includes New England, the balance of the Atlantic seaboard, and the states of Tennessee, Alabama, Mississippi, and Louisiana. This territory is serviced by five district offices, staffed by institute engineers in Boston, New York, Washington, Atlanta, and New Orleans.

Dent, who has directed local institute engineering activities in his district from headquarters in Washington, D. C. since his appointment in 1941, is the senior engineer in point of service of the entire field engineering staff.

Accept Test Boring Bids for West Virginia Toll

In its first opening of bids for its 88-mile toll expressway that will be built at an estimated cost of $96 million, the West Virginia Turnpike Commission accepted low bids on test borings for three bridges and a $5 million tunnel.

Mott Drilling Co. of Huntington submitted these low bids for the bridges: Kanawha River Bridge just east of the Charleston city limits, $18,785; Four-Mile Fork Bridge near Standard, Kanawha County, $3,590, and Bluestone River Bridge near Eads Mill, $3,200. Giles Drilling Co. of New York offered a low bid of $7,264 for test borings for the tunnel at Standard.

ASCE Honors Five

The American Society of Civil Engineers has announced the election of five outstanding leaders in the engineering profession in their respective countries to honorary membership, the society's highest distinction. Two are from the United States. The other three are from France, Canada and Brazil.

The honorary members, who were inducted during the Sept. 3-13 convocation of engineers in Chicago, celebrating the society's centennial and its position as America's oldest national organization of engineers, are: Ervin G. Bailey, New York; Harvey S. Mudd, Los Angeles; Andre L. J. Coyne, Paris; Chalmers J. Mackenzie, Saskatchewan and Ottawa, and Ary F. Torres, Sao Paulo.

Bailey, vice president of the firm of Babcock & Wilcox Co., is past president of the American Society of Mechanical Engineers which awarded him its medal for 1942 for "achievement and leadership in steam and combustion engineering." Last year, for "outstanding engineering achievement," he received the John Fritz Medal, jointly sponsored by the American Society of Civil Engineers, Amercan Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers and American Institute of Electrical Engineers.

Coyne, a member of the American Society of Civil Engineers, is an internationally known designer and builder of dams and is noted also for his achievements in the fields of port and maritime structures and bridges.

Dr. Mackenzie is president of Atomic Energy of Canada, Ltd., president of the National Research Council and director of industrial research and development in the National Department of Reconstruction. He was dean of engineering in the University of Saskatchewan, where he inaugurated engineering courses. Dr. Mackenzie is

Harry S. Sherman

Harry S. Sherman, 75, Hibbing, Minn., retired, former general superintendent of the Hibbing-Chisholm district for Oliver Iron Mining Division of U. S. Steel Co. on the Mesabi range of Minnesota, died at his summer home on Lake Vermilion Sept. 15. Mr. Sherman, a native of Crown Point, N. Y., first arrived on the Mesabi range in May of 1899 as a chemist for the former Minnesota Iron Co. He later spent some time in Alabama in blast furnace operations and subsequently returned to the Mesabi range. In the interim Mr. Sherman acted as a dental instructor and, upon his return to Eveleth as a chemist, served on the school board. In 1912 he was appointed a mine superintendent for Oliver and in 1941 he was named general superintendent, from which position he retired on Jan. 1, 1946. The Sherman mine of Oliver Iron Mining Div. at Fraser, Minn., on the Mesabi range, was named for him. His extensive mining experience led him to become one of Minnesota's best known mine operators.

Survivors include his widow, Mamie, a daughter, Mrs. Charles Perry, Wilmington, Del.; and two sons, Richard, of Whitewater, Tex., and Robert, Hibbing, Minn.

a past president of the Engineering Institute of Canada which, in 1943, awarded him the Sir John Kennedy medal "in recognition of outstanding merit in the profession."

Mudd, past president of the American Institute of Mining and Metallurgical Engineers has been engaged for years in extensive activities in the development and management of important Mediterranean copper mines. With others of his family he established the Seeley W. Mudd Memorial Fund, income from which goes to the Institute for research, publications and other projects advancing the sciences of mining and metallurgy.

Widely known as an authority on cement and other construction materials, Ary F. Torres has been instrumental in the development of many basic South American industries. He is Brazilian Ambassador to the United States Point IV program and president of the National Economic Development Bank of Brazil. A civil engineering graduate of the University of Sao Paulo and of the University of Paris, Dr. Torres was director of the Institute de Pesquisas Technologicas de Sao Paulo, South America's biggest technical research organization.

Atomic Radiation Aid For Better Highways

A General Electric Scintillation counter is an important part of a new test method aimed at producing better highways with the aid of atomic radiation.

In the laboratories of The Atlantic

• Technician of the Atlantic Refining Co., Philadelphia, Pa., utilizes General Electric scintillation counter to test quality and adhesive characteristics of asphalt to be used in road-making.

Refining Co., Philadelphia, Pa., manufacturers of paving asphalt, typical

Continued on page 38

Choose LaCROSSE heavy-duty TRAILERS

85 Models . . . 6 to 67-ton capacity . . . single, dual or tandem axle . . . flat, drop or tilting platform

WITH FULL LINE OF JOB-PROVED ACCESSORIES

REMOVABLE DOLLIES

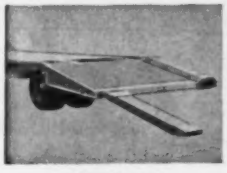
8 sizes—6 to 25-ton capacity—with semi-automatic fifth wheel for converting semi-trailers to full trailers in one simple operation. Provides economical "stand-by" for lay-over operations.

POST LANDING GEAR

Simplifies releasing loaded or unloaded trailers without danger of falling off of blocking. 66,000 lb. gross load capacity with 3 simple hand adjustments for equalizing uneven levels in roadbed.

HAND BRAKE

Increases braking power . . . relieves tension on tractor brakes while holding loads on inclines, or for level parking. Ideal for locking trailer while hooking tractor. Located on left side of gooseneck.



BEAVER TAIL

Increases platform area . . . lowers rear loading point, thus making load easier, safer without use of conventional skids. Short pair of hinged skids (shown) available at slight additional cost.

FIFTH WHEELS

Choice of Holland or Austin designs with capacities from 24,000 to 60,000 lbs. for handling gross king pin loads both on and off highway. Semi-automatic, full floating types with rubber mounting.

SKID RAILS

Furnished on side or rear channels for users who prefer skid rail method of loading. Also complete selection I.C.C. lights, air or vacuum brakes, extension brackets, lash rings, load binder, fire carrier, etc.

Write for free literature

LaCROSSE TRAILER CORPORATION, LaCrosse, Wisconsin

LC-19

LaCROSSE

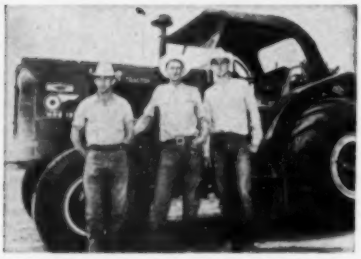
America's Favorite LOW BED TRAILER

This reproduction of our dealer's ad speaks for itself . . .

and is evidence of the tremendous traction secured by WEIGHT TRANSFER for *self-loading* 12

Here is the WORLD'S MOST TOWING-TYPE

THE



Cecil Weldon & Sons chalk up a

$12,000.00 SAVINGS

by NOT having to buy a new scraper!

Top left shows Cecil Weldon and his two sons, Bob and Dick, local rancher and land leveling contractor. Joe Weldon, another son, is in the Army.

The picture at left shows the M-R-S 190 self-loading a 12 cu. yd. struck La Tourneau L-P. Scraper.

Lower left shows the short turning radius of which the M-R-S 190 and scraper is capable.

PATENTED "WEIGHT

Heretofore other prime movers have had to inflate their tires sufficiently to withstand the stresses and strains of hauling heavy payloads at high speeds. This reduced traction and the tractor's ability to load.

M-R-S has overcome this through its exclusive "Weight Transfer." The tractor is equipped with

FOUR STORES

ALLIED EQU

INTERNATIONAL TRUCKS,

Ph. 6-0441 FRESNO 1234 Santa Clara

Ph. 23 REEDLEY 1230 G St.

THE EMBLEM M-R-S OF DEPENDABILITY

MANUFACTURING

yard struck capacity scrapers and powering 20 yard struck, 25 yard heaped scrapers *pusher loaded*.

POWERFUL rubber-tired PRIME MOVER

M-R-S 190

"DIRT-MOVIN'EST TRACTOR I'VE EVER SEEN!" . . .

says Bill Hannickel, land-leveling contractor of Fresno!

Bill Hannickel shown above. Center shows Bill with a heaped load doing a land leveling job on the H. W. Davenport ranch at Five Points. Another feature Bill likes is the fact that this tractor may be easily detached from the scraper and used for numerous other draw-bar jobs required on earth-moving and land leveling projects.

TRANSFER" IS SECRET OF ITS PERFORMANCE!

14-ply rayon tires which require only 22 lbs. pressure for efficient hauling speeds.

During loading, a hydraulic cylinder, controlled by the operator, transfers the weight from the front of the scraper to the tractor itself. This "flattens out" the tires, with a resultant marked increase in traction surface. This is the "secret" of the tractor's exceptional performance.

After the scraper bowl has been filled, the hydraulic pressure is released, returning all of the load back to the scraper, and the tractor's tires are relieved of the temporary flattening effect, which is harmless at low loading speeds. This feature also prevents the transfer to your tractor of the harmful effects of pounding and surging of the scraper during hauling.

TO SERVE YOU

IPMENT CO.

FARM & INDUSTRIAL EQUIPMENT

Ph. 1321 **MADERA** Hiway 99 So. Ph. 30-F-32 **FIVE POINTS** Lassen Ave.

COMPANY

FLORA AND JACKSON, MISSISSIPPI, U. S. A.

News

Continued from page 35

road stone is soaked in radioactive calcium chloride and dried. It is then coated evenly with asphalt, which may contain additives to improve the adhesive characteristics, and the mixture is covered with water for a specified period of time.

If the asphalt separates from the stones, the radioactive calcium chloride dissolves into the water. After evaporation, the radioactivity of the residue is measured with the G-E scintillation counter. A correlation between the radioactivity count and previously prepared charts tells the Atlantic engineers the quality and adhesive characteristics of the asphalt.

Present Safety Award To Contractor's Association

The National Safety Council's new award "for exceptional service to safety" was presented in October to The Associated General Contractors of America at the 40th National Safety Congress and Exposition in Chicago, Ill.

The new award, to be issued annually, gives recognition to associations for the general excellence of their safety programs and for their contribution to the reduction of occupational injuries in their industries. It was presented by Ned H. Dearborn, president of the council, and accepted on behalf of A. G. C. and its chapters by H. B. Alexander, H. B. Alexander & Son, Inc., of Harrisburg, Pa., chairman of the accident prevention committee of A. G. C.

In appraising A. G. C. activities to promote safety in the construction industry, a comparison of the years 1941 and 1951 was made. In that period the number of member-firms of the A. G. C. that submitted reports on construction accidents, an important step in the overall effort to reduce accidents, increased 655%.

The contractors' association has more than 6000 member-firms in the U. S. and Alaska who annually perform the majority of contract construction work in this country as well as a large volume of work overseas. The figures showed a greater number of smaller operators reporting, the average annual payroll hours per firm being 67% less in 1951 than in 1941. The average number of lost-time accidents per million hours worked in 1951 was 75% of the 1941 rate. The average number of days lost due to accidents for each 1000 hours worked declined 35% in 1951 over 1941. The reduction in insurance rates for the various job classifications in the construction industry in spite of increased benefits was considered highly significant and represents an enormous over-all saving in construction operations for the 10-year period.

The A. G. C. was commended for publication of its revised *Manual of Accident Prevention in Construction*, which received approval of the American Standards Association in January, 1952, and was issued in a series of pocket size reprints, and for its nationally integrated safety organization.

Harry Oscar Underhill

Harry Oscar Underhill, 62, southern representative for Alpha Portland Cement Co., Birmingham, Ala., died Sept. 2 in a Birmingham hospital. Burial was in Albany, N. Y.

Born and educated in Albany,

Mr. Underhill was graduated from Cornell University in 1913 from the engineering college. He was fullback on Cornell's football team in 1911, 1912 and 1913, and was an All-American candidate his senior year. He also held membership in the Cornell Glee Club, the Sphynx Club, and Theta Xi engineering fraternity.

His widow, Mrs. Gillespie Underhill, survives.

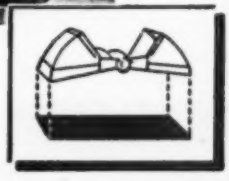
Overcome Russian Ban on Manganese Shipments

Manganese, the essential element in steelmaking, is reaching the United

Continued on page 41

ERIE *Barge Type* Bucket

In this type the large deck area achieved means bigger payloads in stock piling and barge rehandling work. Erie's booklet on 2-line buckets gives you complete data on this type and 3 other classes of Erie Buckets. Write for copy today.



Compare **DECK AREA**

¾ Yd.	27.21 Sq. ft.
1 Yd.	30. Sq. ft.
1¼ Yd.	32.3 Sq. ft.
1½ Yd.	38.7 Sq. ft.
1¾ Yd.	42.4 Sq. ft.
2 Yd.	45.1 Sq. ft.
2¼ Yd.	53.5 Sq. ft.
2½ Yd.	57.6 Sq. ft.
3 Yd.	68.9 Sq. ft.

Write for Catalog **2L-2** *Today*

ERIE
STEEL CONSTRUCTION COMPANY

4212 GEIST ROAD • ERIE, PENNSYLVANIA

Look at the production

27¢

buys

One hundred and seven times each hour, this busy, hustling Lorain Shovel turns and disgorges one ton of limestone into trucks. Coolly and efficiently the "Caterpillar" D318 Diesel Engine that powers this shovel works in limestone dust, rain and heat, until at the end of an 8-hour day 850 tons of limestone have been loaded.

That's powerful production, but what does it cost? To get *more than 100 tons* of limestone an hour, the Diesel uses only *27 cents' worth of fuel.* That's because "Cat" Engines use low-cost, non-premium fuel—without fouling. No wonder then that the owners, Columbia Rock Products Corp., Columbia, Tenn., say:

" 'Caterpillar' equipment is tops for quarry work, excavating and grading, and mining phosphate. Our old gas-engine-powered shovel used 50 gallons of gasoline a day against 16 gallons of fuel oil used by the 'Caterpillar' D318 Engine."

The "Cat"-powered shovel works in a one-acre quarry, 50 feet deep. It operates on four different levels. Rock is shot every other day.

Besides the D318, Columbia Rock owns this other "Caterpillar" equipment: another "Cat" Diesel to power a second Lorain Shovel; a D6 Tractor, and a motor grader.

Hard-working, economical "Caterpillar" Engines, up to 500 horsepower, are available in machines made by leading equipment manufacturers. Let your "Caterpillar" Dealer show you engines that will lower your costs and boost your production and profit.

CATERPILLAR, PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

BUCYRUS-ERIE HYDROHOE

Double-Action Dragshovel with a Quick Conversion Bonus

THIS new Bucyrus-Erie Hydrohoe not only pays its way as a dragshovel, but for users requiring only a part-time excavator, it can be converted to crane front-end in the field amazingly fast (less than four man-hours by actual report). For example, with a Hydrohoe you can dig foundation footings, then convert to crane front-end, and use it with a concrete bucket to pour footings — or for any other lifting or material handling jobs.

Double Action! The Bucyrus-Erie Hydrohoe gives you two separate digging actions: the first is the conventional dragshovel action of the dipper moving through its digging arc; the second, a separate horizontal stroke, obtained by telescoping the boom. Unit is available with both 18- and 12-in. wide bucket.

Look at these Hydrohoe Advantages

- **Eliminates up to 40 percent of time lost moving up.**
- **Precision control — every work function fully hydraulic.**
- **No bails, sheave blocks or drag ropes to interfere with loading.**
- **By telescoping boom, operator can peel off scallops at grade level — dig a smooth, level trench.**
- **Hydraulic ejector, built into dipper, assures fast, clean dipper dump — makes it practical to use a narrow 12-in. wide dipper.**
- **Travel up to 50 mph on open highway.**

A quick boom switch — and here's your Hydrocrane, the outstanding performer for placing concrete slabs, erecting pre-fab sections, setting pipe, stockpiling in yard, etc.

BUCYRUS ERIE HYDROCRANE — SOUTH MILWAUKEE, WISCONSIN

Send coupon for full details.

BUCYRUS-ERIE HYDROCRANE DIVISION
South Milwaukee, Wisconsin

Gentlemen:

☐ Please send Hydrohoe and Hydrocrane literature.
☐ I am interested in a demonstration.

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188H52

Continued from page 38

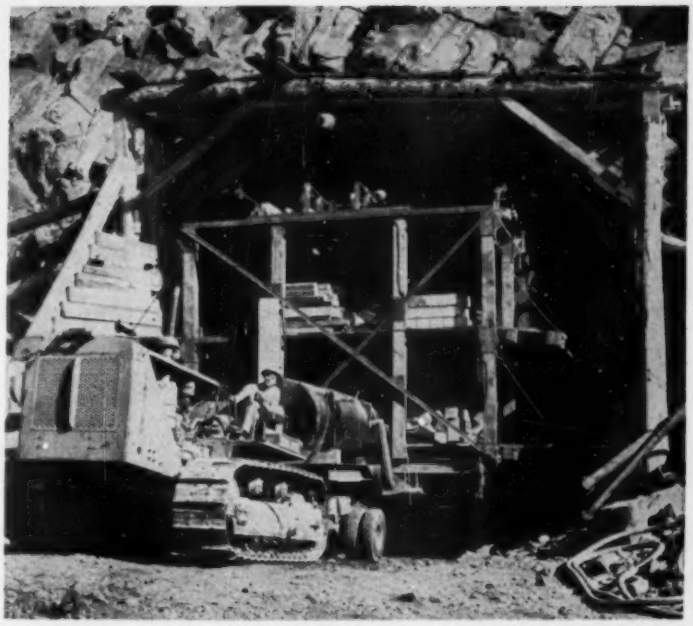
States despite a three-year export curtailment on that metal by Russia—the former chief supplier to the U. S.

By increasing imports from Africa, Asia and Latin America, the United States has overcome the Russian near-freeze on manganese, stated a recent report of the American Iron and Steel Institute. American steel companies have aided this effort by giving technical and financial assistance in the development of the numerous alternate sources of manganese supply.

The United States is about 90% dependent upon imported manganese. Russia was this country's largest source of imports prior to World War II and again in 1948 but in 1951 supplied a negligible amount. In spite of that loss, total imports of manganese reached a record 865,000 tons in 1950, and declined only slightly in 1951.

Africa is becoming an increasingly important source of manganese. In 1948 and 1949, the United States supplied steel for ore cars urgently needed to speed mine shipments in the Union of South Africa, with the result that that country became the second largest source of imports in 1950 and 1951.

India is currently the biggest source of manganese for the steel industry of the United States.



• A triple-decker "jumbo" drill rig is at work driving two 31-ft. diameter diversion tunnels through rock abutment of Palisades Dam, a Bureau of Reclamation dam being constructed on the Snake River in eastern Idaho. Mounted on its decks are 15 compressed air drills which are drilling holes 8 to 12 feet deep. After drilling about 120 holes, the "jumbo" is wheeled out by the tractor, and holes are loaded with powder and blasted. While the loose material is being removed from one of the tunnels, the "jumbo" goes to work on the other. Both tunnels will be concrete-lined to an inside diameter of 26 feet. Later, one will become a power tunnel, 1,213 feet long, and the other an outlet tunnel, 1,580 feet long. *Bureau of Reclamation Photo*

USAF Engineers Trained in Building Construction

The first training project of its kind for U. S. Air Force Engineers passed its initial phase at Marietta, Ga., where about 160 officers and men have begun using a 495,000 square-foot steel storage structure erected by them from the ground up.

The huge warehouse—a standardized single-story, steel frame building—was produced by the Luria Engineering Co. at its fabricating plant in Bethlehem, Pa., and shipped by rail to its erection site earlier this year.

Work on a second storage building of the same type, which will have a floor area of 480,000 square feet, has just been started by the engineer-trainees. It will be completed after the first of the year.

Both warehouses are to be used by the Lockheed Aircraft Corp., which has a B-47 manufacturing plant at the Marietta site, and the Air Material Command for the storing of parts, equipment and machine tools.

The project was developed jointly by the Air Force and Lockheed to provide training in steel erection and general building construction for officers and men of the 835th Engineer Aviation Battalion, a reserve unit of the Aviation Engineer Force from the Wolters Air Force Base at Mineral Wells, Tex.

The trainees worked from the set of erection instructions that was supplied by Luria Co. at the time the "packaged" buildings were shipped. Prior to the start of erection of the first building last June, the engineers cleared and graded the ground and constructed drainage system.

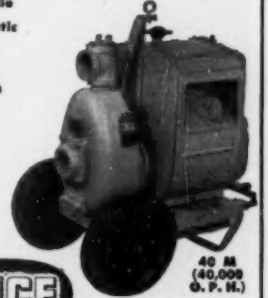
Receive Bids On Two-Mile Parkway Stretch

Bids for grading and stabilizing of about two miles of the Garden State Parkway line in the vicinity of Matawan and Cheesequake Creeks were received by the New Jersey Highway Authority on the 16th of October.

Specifications provide for alternate methods of stabilizing the swamp land over which the parkway will run in this area. One method calls for removing all existing mud and replacing it with solid material. The second method, known as "sand draining," leaves the mud in place but squeezes all water from it to form a solid foundation.

If the excavation method is used, a total of nearly 3 million cubic yards of mud will be removed within the 2-mile stretch. To elevate the parkway above the surrounding swamp land, more than 3.8 million cubic yards of earth fill will be required.

Available with Pneumatic Tires, Steel Wheels or Skids



40 M (40,000 G. P. H.)

RICE

Self-Priming

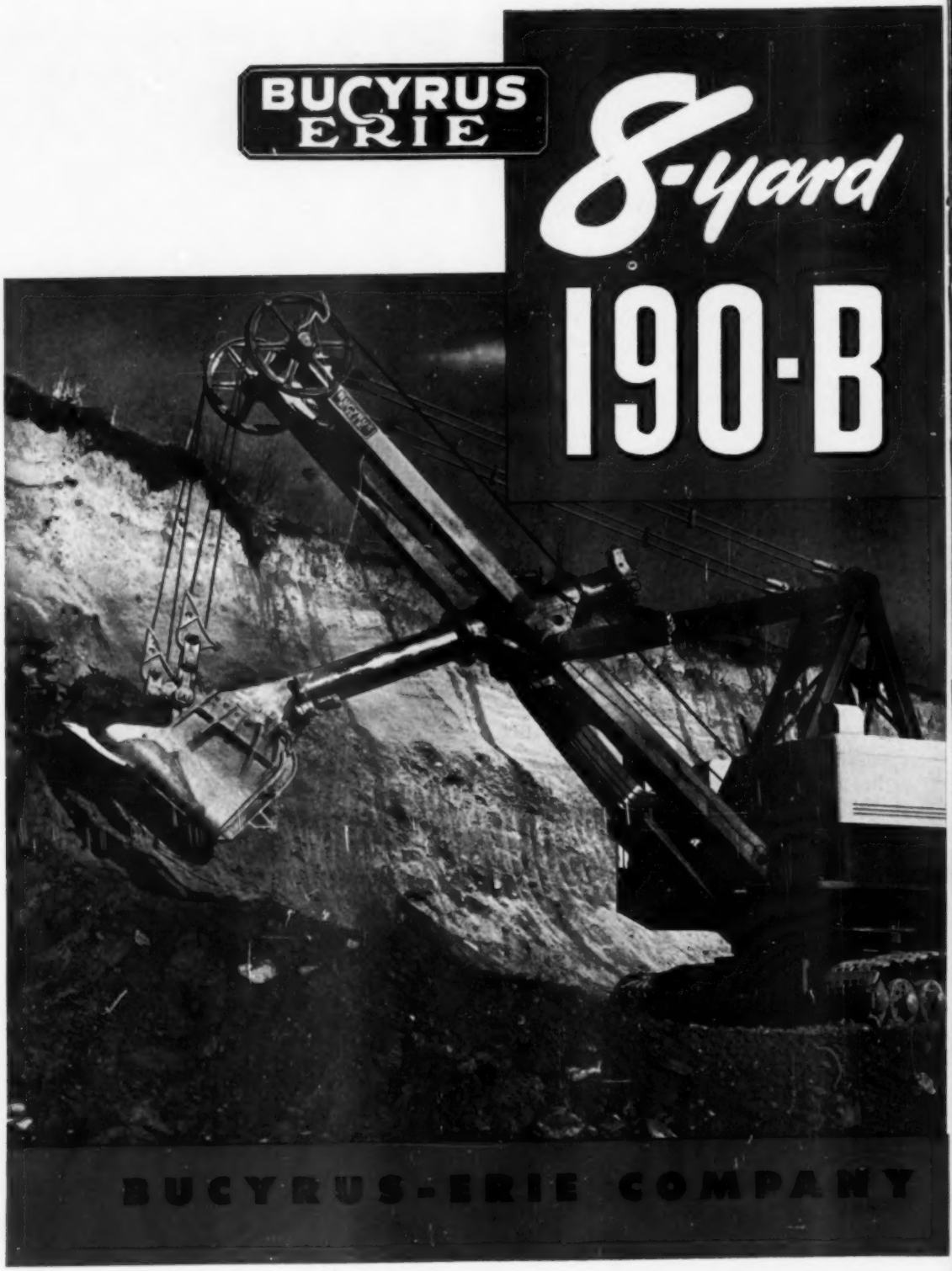
CENTRIFUGAL PUMPS

Engine, belt, and electric driven pumps with many new features to give you low cost, dependable performance. A. G. C. rated. Easily replaced wearing parts keep Rice Pumps young at low cost.

Write for special bulletins.

RICE PUMP & MACHINE CO.

234 N. 12th Ave. Grafton, Wis.


BUCYRUS ERIE
8-yard
190-B
BUCYRUS-ERIE COMPANY

ANOTHER SMOOTH, FAST, BIG OUTPUT SHOVEL

for mines and quarries

The new 190-B follows the tradition of Bucyrus-Erie leadership in producing high quality excavators capable of delivering consistently big output at lowest possible cost per cubic yard. This 8-cubic yard shovel and dragline offers you many outstanding features — features that add up to greater capacity, higher output, and faster, smoother, more economical operation. Among these outstanding features are:

EXCLUSIVE TWO-SECTION BOOM

reduces shovel front-end weight, increases swing speed and payload capacity, yet provides ample strength for tough digging.

POWERFUL, MAIN MACHINERY

designed for double twin hoist, delivers power surely, smoothly, efficiently.

LARGER, STRONGER MOUNTING

provides ample strength for heavy duty and protective features for minimizing wear.

The 190-B has full Ward Leonard improved rotating control, is readily convertible to dragline service, and has numerous other outstanding features to meet the production demands of your toughest jobs.

SOUTH MILWAUKEE, WISCONSIN

Equipment
You Ought to Know About

FM Base Station

Manufacturer: Motorola Corp., 4545 Augusta Blvd., Chicago 51, Ill.

Claims: A locally controlled base station housed in desktop cabinet is designed for use in the 450 to 460 mc. range as well as the 460 to 470 mc. range.

The principal advantage of operation in either of these bands is elimination of the channel crowding encountered on lower frequency bands. Less interference, lower noise levels, easier licensing and extra channels for system expansion are additional advantages claimed.

The lower frequency band is restricted to use by organizations involved in land transportation, public safety, and domestic and industrial public services. The higher band is open to individuals and organizations who were previously ineligible.

The unit designed for use in the 450 to 460 mc. band has a nominal power output of 20 watts.

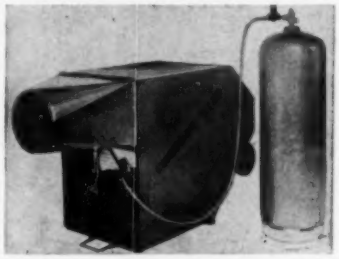
The new unit features the "sensicon" receiver design with its triple I.F. conversion and PERMAKAY filter which enables permanent selectivity under adverse conditions of temperature, humidity and vibration. High Q, silver plated, sealed tuned cavities provide an RF signal pre-selection selectivity and sensitivity by a conventional tuned circuit. The receiver also incorporates automatic frequency control and noise compensated squelch circuit.

The transmitter contains the I. D. C. (Instantaneous Deviation Control) circuit patented by Motorola which restricts deviation to the limits set by the FCC. A coaxial line filter reduces spurious and harmonic radiations.

Portable Heater

Manufacturer: International Manufacturing Co., 2249 South Delaware St., Denver, Col.

Claims: From the liquid propane gas equipment industry comes a new



WELLMAN *Williams Type*

FAST BUCKET OPENING SPEEDS OPERATIONS

• Double-hinge construction on Wellman's multiple-rope bucket permits faster opening than a single hinge. This speeds up operations, also gives a bigger spread in the open bucket for the same headroom.

Wellman's welded-design buckets offer you better performance and longer service. In all types and sizes you'll do better with Wellman!

Want Facts?

Write for free descriptive bulletins.

CLAMSHELL • DRAGLINE
CUSTOM-BUILT BUCKETS
STONE AND WOOD GRABS

THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue
Cleveland 4, Ohio

product named the Chinook Wind Portable Heater.

The Chinook Wind is said to provide instant, on-the-spot heat which is both safe and clean.

It is 2 feet wide, 3 feet high and 4 feet deep, outside measurements, and weighs 150 pounds. It's fully portable, and can be moved by one man, utilizing its rubber-tired, semi-pneumatic, ball-bearing wheels. The heating unit is a cast iron torch with a motor driven fan, delivering a maximum capacity of 3,500 cfm at 250°, 500,000 B.t.u.'s maximum capacity.

Another Chinook Wind product is the Chinook All-Purpose Torch recommended by the manufacturer for contractor work and pre-heating welding work. Capacity of the torch is 750,000 B.t.u.'s down to 50,000 B.t.u.'s.

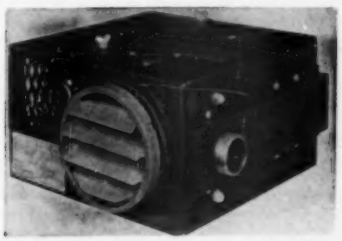
Flexible, flame- and water-proofed canvas duct, 12 inches in diameter, in 12 and 24 foot lengths, reinforced, is available for the Chinook Wind Portable Heater to carry the heat to the exact spot needed.

Gasoline Heater

Manufacturer: Hunter Manufacturing Co., 1550 East 17th St., Cleveland 14, O.

Claims: The Model UH47 Hunter gasoline heater for either Diesel or gas-powered trucks and tractor cabs has been improved by a new manifolding system. The new manifold permits exhausting of combustion gases at any point desired within a radius of 12 feet from the heater, as compared with a previous limit of 30 inches. Bases may be exhausted to the outside of the vehicle at either side, top, bottom, front or rear. The new manifold permits efficient operation of the heater without use of the exhaust cap.

The gasoline burning Hunter Heater operates independent of the vehicle engine, providing full heat delivery



under thermostatic control. It eliminates the engine idling required for the provision of hot-water heat during off-the-road and layover periods. It burns any type gasoline, averaging less than one pint of fuel consumption per hour.

Easily installed, the heater may be

Continued on page 49

Are you getting these

Extra Dividends

from Red-Strand preformed wire rope?

● DO YOU KNOW that Hercules® Red-Strand preformed wire rope consistently lasts longer . . . speeds up operations . . . improves working economics?

Does the preformed rope you use have the right degree of flexibility? Does it have absolutely correct strand clearances?

Are you getting preformed wire rope that is manufactured with the precise care . . . the exacting insistence upon higher-than-usual quality . . . and the specialized craftsmanship that goes into Hercules Red-Strand preformed wire rope?

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*Reg. U.S. Pat. Off.

A. Leschen & Sons Rope Co., St. Louis 12, Missouri

In business *only* to make wire rope — *better* wire rope — since 1857.

DISTRIBUTORS IN ALL PRINCIPAL CITIES

HERE'S HOW *Burns Brick Co.* increased clay supply from 30 to

New method cuts manpower needs 55%, reduces costs 66%

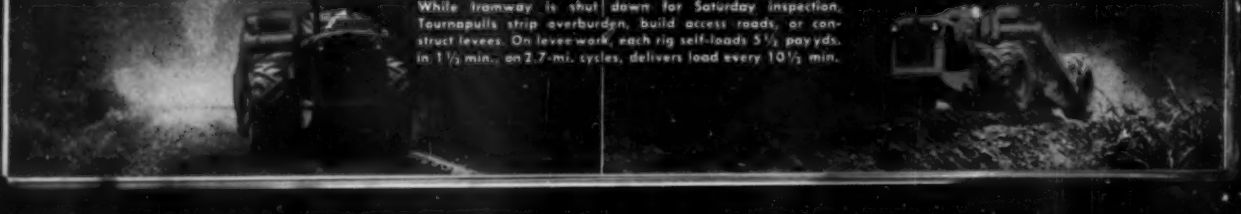
Getting enough alluvial clay to fill ever-increasing production goals has always been a problem for Burns Brick Company, Macon, Georgia. Prior to 1942, material was hauled from pit to plant in shovel-loaded dump trucks. From 1942 to 1950, 4 diesel trains of 4 cars each were used. Production reached 30 tons an hour with this method . . . but, by 1950, demand had exceeded even this supply. More clay was needed . . . fast! The job of boosting output fell to the company's vice president, Henry K. Burns, Jr.

Tournapulls solve feeding problems

Burns had his men build a 3-mile pit-to-plant aerial tramway, running from a hopper and feeder at the clay pits to a 50,000-ton storage shed at the plant. 187 one-ton capacity aluminum buckets spaced 160′ apart and moving 6 m.p.h. were provided to carry the material over the long cable. About 180 tons of clay could be brought in hourly, *if* the hopper could be fed fast enough. First feeding tools tried were 2 crawler-scrapers with 19 yds. combined capacity. Even under the most favorable conditions, these 2 rigs could deliver only 120 tons hourly. Next Burns tried 2 rubber-tired 7-yd. D Tournapulls. They solved the problem! Output was more than enough, and costs were low. After more than a year of operation, major benefits were analyzed as follows:

1. *More production.* Tournapulls have helped boost output *6 times* over that of dragline and rail cars and *50%* over crawler-scrapers — from 30 to 120 to 180 tons per hour. Company production records show the 2 "D's" have averaged 1727 tons per 9½-hour shift . . . or 90.9 tons per hour per machine. At times, the "D's" have supplied enough clay in 20 hours to last the brick production line for a week. In spare time, rigs build access roads and levees on Burns Company property.

2. *Lower costs.* Conversion to the new feeding method has cut costs by two-thirds, according to accurate records kept by the company. Says Mr. Burns: "Our 2 D Roadsters are giving us high production at a very low cost per ton. *Negligible tire wear* (less than ⅛" on drive tires after 9 months of use) and *low fuel consumption* (about 3 gallons per hour per machine . . . or 30 tons of clay per gallon)



While tramway is shut down for Saturday inspection, Tournapulls strip overburden, build access roads, or construct levees. On levee-work, each rig self-loads 5½ pay yds. in 1½ min., on 2.7-mi. cycles, delivers load every 10½ min.

Loaded "D's" climb 12% to 15% grade on 100'-ramp to hammermill hopper. With increased clay supply, the Company now turns out 1,250,000 bricks per week. Ten years is the expected life of this pit before tramway will have to be extended.

Tournapull speed up over hammer dumps load in a few seconds. Cycles average 2000'. Combined cubage of the 3300-lb. material per load. Now over 2400 hours on the 2 Tournapulls, Owner Burns reports "no downtime to date".

180 tons hourly

— together with Tournapulls' *efficient electrical system* and their *self-loading ability* — are reflected in the low cost of each ton of clay we move."

3. *Fewer men.* Stripping and hauling with the rail system required a crew of 20 . . . the tramway system requires only 9. Besides the 2 D Roadster operators, 3 men are at loading stations, 2 at clay shed, and 2 at intermediate angle stations. In the near future, the 2 angle station positions may also be eliminated.

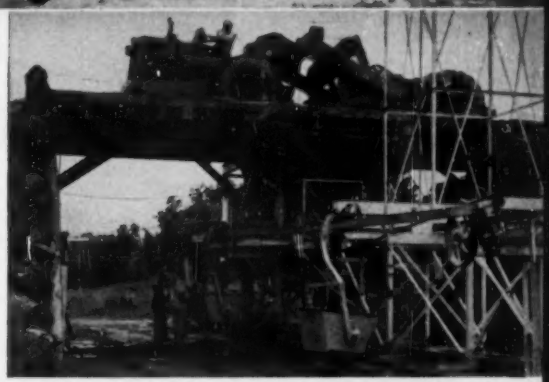
4. *Better mixture control.* By making thin cuts of rich clay from one part of pit, and selectively-loading lean clay from another part, Tournapulls automatically blend material in mixture best suited for use at plant. As Burns puts it, "Tournapulls' ability to self-load either slippery wet or hard dry clay enables us to get a more uniform mixture, assuring us a more constant size and a more uniform color in our bricks."

Reduce your costs, speed output

Investigate how much Tournapull can save and earn on *your* dirtmoving. See for yourself . . . ask your LeTourneau Distributor for production data on work like yours.

R. G. LeTOURNEAU, INC.

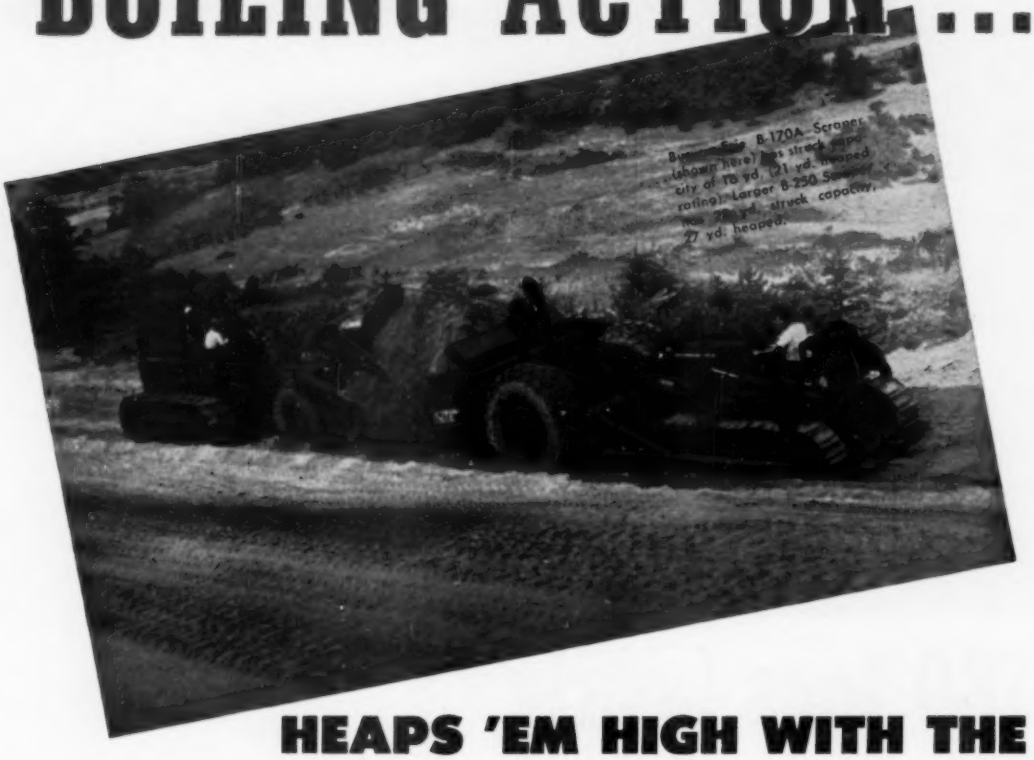
Peoria, Illinois



Maintaining 5-to-1 side slope for good drainage, Tournapulls self-load rich and lean alluvial clay in blend best suited for use at factory. Loading in 2nd gear, "D's" make shallow cut over 60' to 300', shaving clay in small pieces for easier handling at plant.

Tournapull—Trademark Reg. U. S. Pat. Off. DP-31-BC

"BOILING ACTION"...


Bucyrus-Erie B-170A Scraper (shown here) has struck capacity of 18 yd. 21 yd. heaped rating. Larger B-230 Scraper has 28 yd. struck capacity, 37 yd. heaped.

HEAPS 'EM HIGH WITH THE

BIG RED TEAM

YOU'LL get plenty of heaped loads with Bucyrus-Erie B-type Scrapers. Dirt *boils* up into bowl, is broken into small pieces to eliminate voids. You get a smooth, even, compact and *full* load.

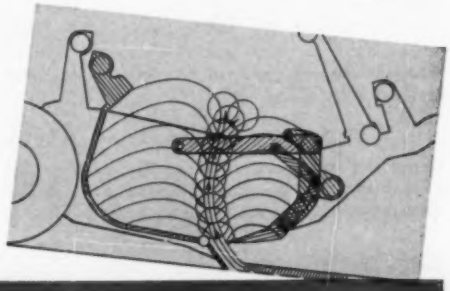
The Big Red Team — combination of Bucyrus-Erie B-type Scraper and International TD-24 tractor — not only loads full but loads fast and in a short distance and has moved more dirt at less cost than competitive units in one field test after another.

See your International Industrial Tractor Distributor for all details on the dirt hauling member of the Big Red Team . . . ask for a demonstration and see for yourself why it's your best bet for really low cost dirt.

"BOILING ACTION"

In B-type Scraper causes dirt to fountain through the load, spreading forward into apron and back into bowl for the heaped loads that mean big production.

38T52C



SOUTH MILWAUKEE BUCYRUS ERIE WISCONSIN

SEE YOUR INTERNATIONAL INDUSTRIAL TRACTOR DISTRIBUTOR

New Equipment

Continued from page 45

fueled direct from vehicle tank by electric pump or equipped with its own fuel tank for use with Diesel engines. Constant circulation of warm air at any temperature desired is maintained by an electric blower fan. Controllable heat range is from 5,000 to 15,000 B.t.u. per hour.

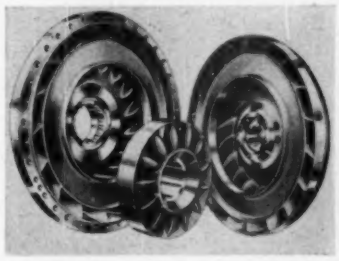
Torque Converters

Manufacturer: Torcon Corp., 1144 West Fifth St., Ashtabula, O.

Claims: The manufacturer's line of hydraulic torque converters was recently expanded to include 11, 13, 14, 15, 16, 17, 18, 19, 24 and 26-in. wheel diameters. The smallest model can be used with gasoline or Diesel engines rated from 30 to 80 hp and the largest with 150 to 600-hp engines, with other models covering the intermediate ratings. Each size can be furnished with or without cut-off clutch.

The single-stage, three-element type torque converters are automatic hydraulic transmissions featuring variable speed and torque ratios. They combine a hydraulic torque converter and hydraulic coupling in a single unit which retains the advantages of both. Transition from the converter range to the coupling range is effected automatically without outside controls. Full utilization of engine horsepower is assured throughout entire range of part to full throttle operation.

Transmissions have been designed and constructed specifically for the

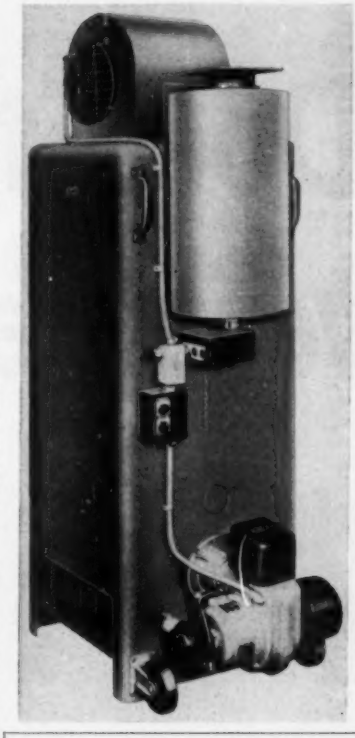


"working class" of equipment. They are particularly applicable to Diesel and gasoline shovels, lift trucks, buses, cranes and draglines, oil field drilling and servicing rigs, logging machinery, rail cars, switching locomotives, road machinery, tractors and similar equipment.

Heating Unit

Manufacturer: Fageol Heat Machine Co., 5725 Mt. Elliott Ave., Detroit 11, Mich.

Claims: A new 168,000 B.t.u. unit with an adjustable vent for permanent installation or portable on-the-job use



is known as the Fageol Model VO-168. The machine sprays heated air out across floor areas to form a 6-ft. blanket of warmth in the work zone. According to the manufacturer, this principle of heating from the floor up avoids wasting heat in unused, overhead areas.

When used with a flue and vented outside, Model VO-168 is recommended for permanent use in confined areas such as small plants, garages, offices, warehouses, barracks, trailers. Heat output vented is 130,000 B.t.u. per hour. When used without a flue, free heat is directed back into the blower and discharged "superheated," increasing output to 168,000 B.t.u. per hour. Unvented, the new Fageol Heat Machine is recommended for on-the-job use in construction work. Equipped with wheels for easy portability, it can also be used for de-icing wheels and transmissions.

Model VO-168 operates from a detached fuel supply, burning No. 1 or No. 2 fuel oil, kerosene or Diesel oil. A 10-gallon fuel tank may be attached to the unit as optional equipment. Dimensions of the machine are 21 x 33 x 69 inches. Weight is 345 pounds. Burner is UL-approved gun type, pressure atomizing. Machine can be started or stopped by snapping a switch.

Dewatering 1500' of 8' x 14' deep sewer trench at a river crossing, this 4" Jaeger pump handled 40,000 gph at average speed of only 1200 rpm (10% to 15% lower speed than other pumps), and reprimed quickly, as needed, at 1400 rpm (compared with 1800 to 2000 rpm required to prime ordinary pumps). This is typical performance. Jaeger's larger shells and impellers, double priming action and use of largest engines applicable mean high efficiency, fuel economy, long life — in 1½" to 10" pumps.

See your Jaeger distributor or send for Catalog P-10

THE JAEGER MACHINE COMPANY 553 Dublin Avenue, Columbus 16, Ohio

COMPRESSORS • MIXERS • HOISTS • TOWERS • PAVING MACHINERY

What Does it Cost to Move a Yard of Earth?

Three MARION 191-M shovels are handling the excavation work for two giant dams on the Missouri River. Their records in soil, clay, shale and rock are making excavating history that will be significant in heavy construction and mining.

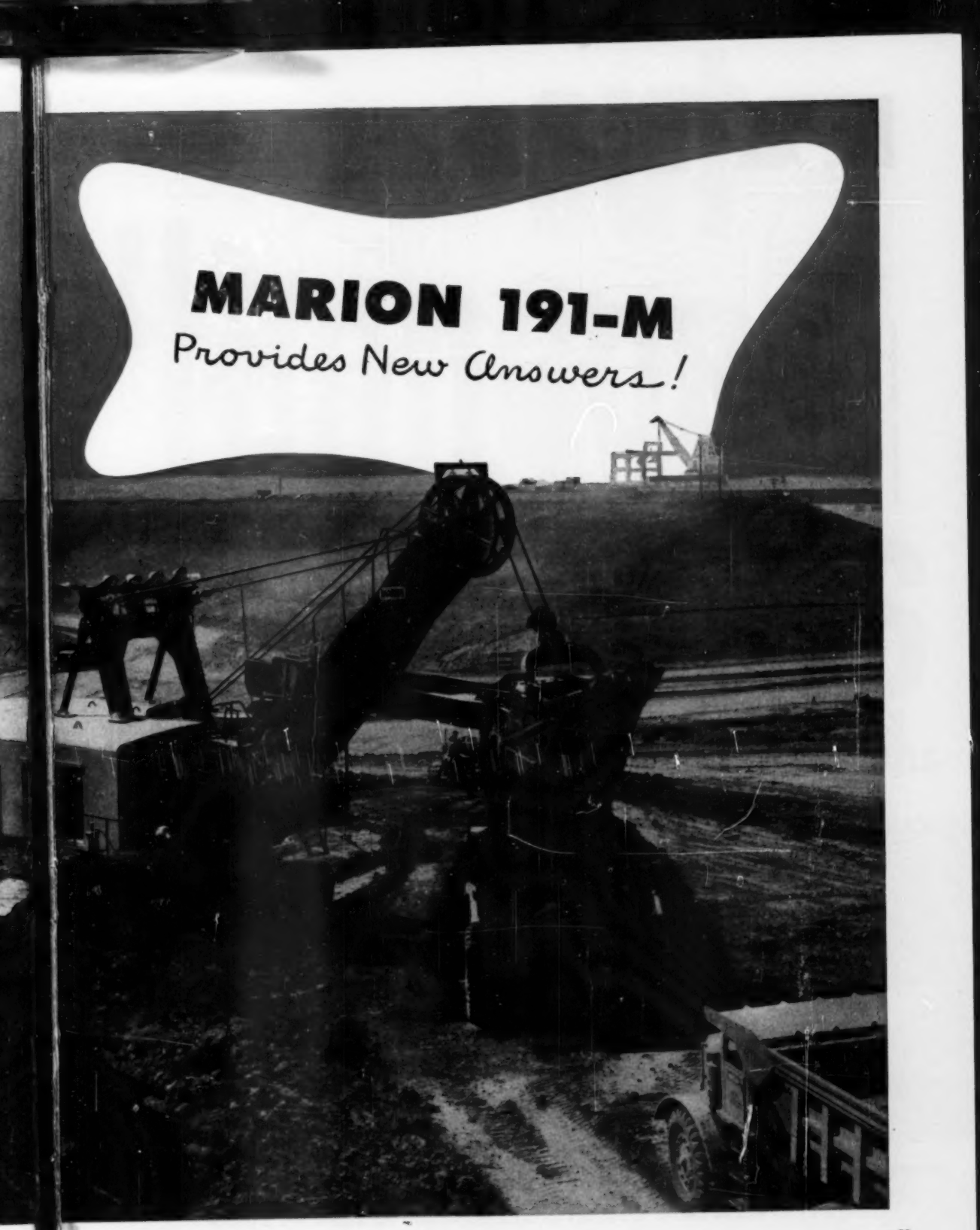
Big dipper capacity, tremendous power and real speed (18-second cycle time—as fast as your smallest machine) make the MARION 191-M an outstanding performer where big yardages are needed. What is the cost of moving a yard of dirt, rock or ore? The 191-M provides new and interesting answers. Write for the details.

MARION POWER SHOVEL COMPANY

Marion, Ohio, U. S. A. • from ¾ cu. yd. to 45 cu. yds.

Offices in Principal Cities Throughout the World

MARION 191-M, the world's largest loading shovel, at Ft. Randall Dam.

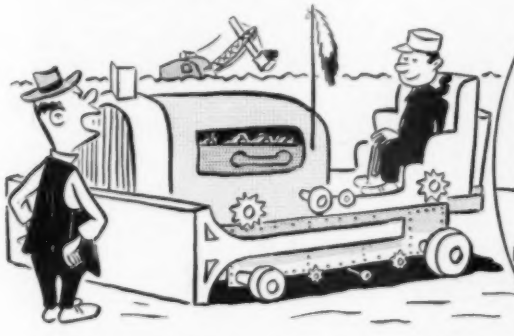

MARION 191-M
Provides New Answers!

EX-LAFFS

By Mauro Townsend

"I see Frank and his twin brother are pulling their favorite gag on our new surveyor."

"Tell me the truth now, don't it make you feel better?"



"Who gave you permission to make a hot rod out of it?"

"What else could I do, the paper say s rain, and you know my storage shack leaks?"

cut tonnage costs

with P&H ELECTRIC SHOVELS

In more and more locations these ultra-modern P&H machines are taking over the jobs that call for big production — steady digging. Users who know their cost accounting come back for more — for one proved reason . . . *lower tonnage costs.*

Contributing factors are these:

P&H Magnetorque* Hoist Drive powers hoisting motions electro-magnetically, gives you snappier dipper action — eliminates hoist generator, slip friction clutch and other troublesome mechanical devices.

P&H stepless power regulation is smooth and accurate — with no control fingers or contactors to give you trouble.

Independent propel, all-welded construction, filtered air cab and other modern refinements have led the way to more dependable production on a year-in, year-out basis.

If you seek lower tonnage costs in open pit work, let us tell you where you can see a P&H Electric Shovel in action. Ask about a P&H today.

*T.M. of Harnischfeger Corporation for electro-magnetic type clutch

Every third P&H Electric Shovel sold is a repeat order

HARNISCHFEGER CORPORATION

4400 West National Avenue • Milwaukee 46, Wisconsin

POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FABRICATED HOMES

New trade literature

Subject: **Lubrication Handbook**
Content: A comprehensive presentation of the whys and wherefores of lubrication is provided in an attractive, well-illustrated 26-page booklet published by the Service Department of Euclid Road Machinery Co. The publication not only details procedures for Euclid equipment, but discusses the fundamentals of lubrication. Characteristics of lubricants, their properties and tests, reasons for oil and lubricant changes, proper lubrication intervals and recommended procedures are also included.
Where to get: Euclid Road Machinery Co., Cleveland 17, O.

Subject: **Cup-Type Goggles**
Content: A new line of cup-type goggles including chippers, welders, and dust and splash goggles, are described in a four page, illustrated bulletin. It emphasizes the comfort design and pressure-free fit of the eye cups, with each cup individually molded to conform to both right and left eye areas of the face, with smooth wide-bearing facial contact surfaces that evenly distribute the weight. More than 300 perforations in side-shield are said to allow ample air circulation, and added ventilation through slots in lens ring provides circulation across inner lens surface to reduce fogging. Herringbone-shaped channels in lens seat allow air entrance but block out foreign particles. Cups are unaffected by moisture or perspiration. Both the dust goggle and chippers goggle are available in transparent models with special side-shield ventilation. All goggles have ball-chain nose bridge, with quick acting lever-type lock for easy adjustment. Lens rings are free-turning, screw type of anodized aluminum for easy lens changing.
Where to get: Fendall Co., 4631 N. Western Ave., Chicago 25, Ill.

Subject: **Rear-Dump Unit**
Content: A 28-page booklet in color, describing and picturing the LeTourneau Tournarocker, a modern rear-dump designed as a unit for off-road and highway hauling of dirt, rock and ore, has just been issued. The booklet includes action shots and cut-out photos of integral parts of the machine. Its fingertip electric control system, 90° turning ability, instant shift transmission and torque converted, and big tire features are colorfully illustrated in numerous photos and diagrams. The Tournarocker can be had in 9, 18, 35, or 50-ton custom-built capacities.

Where to get: Advertising Department, R. G. LeTourneau, Inc., Peoria, Ill. (Tournarocker Bulletin TK-137)

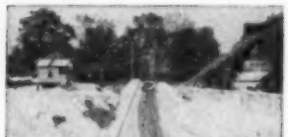
Subject: **Analysis of Landslides**
Content: There are few problems highway engineers face which are more complex than those associated with sliding masses of earth. Their occurrence, although sporadic in some areas, is commonplace over relatively large areas widely separated in the United States. In those areas large sums must be expended in combating slides in progress or for constructions to prevent slides on new projects. Thus,

Picture shows a 10 cu. yd. Sauerman Crescent Scraper grading a bank of the Mississippi River to provide the desired slope for a concrete revetm nt. The scraper is attached to a carrier riding on a slank cable suspended between a Bucyrus-Erie dragline mount-d on a barge and a low tail tower travelling on the bank. The scraper levels off the bank and drags the earth out into deep water at a rapid rate.

Photo, War Dept., Memphis District, Corps of Engineers.

. . . and cut your handling costs by using
SAUERMAN SCRAPERS

Above is a medium size Crescent bottomless scraper with teeth, design-d for heavy excavating duty. It digs and hauls heaping loads faster—requires less power per yard handled—than other types of scrapers.



Sauerman machine operating a 3 cu. yd. Crescent scoop on a 700-ft. haul in a deep gravel pit, digs and hauls 120 tons an hour to keep a big plant humming.

Digging power, haulage speed, and long reach—plus simplicity of operation—are combined in a Sauerman Drag Scraper. It provides a "one man, one machine" system for efficient and economical handling of a wide variety of earth moving jobs.

A Sauerman Drag Scraper can be used to excavate hard packed gravel, move wet sand, coarse aggregate or sticky clay, haul and stockpile bulk materials, remove sludge from settling basins, etc. Its versatile working range adapts it to extremely compact operations as well as those extending over large areas. The unique, bottomless bucket is controlled from a safely located operating station, thus eliminating the need for sending men or equipment into dangerous locations.

Initial investment is moderate and maintenance costs are exceptionally low, since only the most expendable parts of the Sauerman Scraper contact the material in which it is working. Diesel, gasoline, or electric power consumption is small compared to the tonnages handled.

For complete information and engineering data on Sauerman Scrapers for earthmoving, write for Catalog A.

Rope Haulage Equipment Specialists Since 1909

SAUERMAN BROS., Inc.

574 S. Clinton St. Chicago 7, Ill.

the problem is both one of economy and one of engineering technology. The Highway Research Board Committee on Landslides, which was formed in 1949, sponsored two papers for the 1951 Annual Meeting. Bulletin 49 contains these papers: The first paper, "Determining Corrective Action for Highway Landslide Problems," by R. F. Baker, engineer of soil mechanics of the State Road Commission of West Virginia, includes in addition to a review of the analyses of over 100 landslides, appendices which show typical stability analysis, methods for eliminating slides, and descriptions of several control methods and retaining devices for correcting slides. The second paper, "Use of Field, Laboratory, and Theoretical Procedures for Analyzing Landslides" by H. Gordon Larew of Purdue University, reviews previous engineering considerations pertaining to landslides and describes field and laboratory tests which were made in the analysis of a landslide area.

Where to get: Highway Research Board, National Research Council, 2101 Constitution Ave., Washington 25, D. C.

Subject: **Electrode Bulletin**

Content: A new, 49-page, pocket-size booklet describing the application, chemical analysis, and mechanical properties of General Electric welding electrodes has recently been made available. Designated GED-1634, the new booklet also includes an electrode trouble-shooting chart which specifies the number of electrodes per pound, and an explanation of the significance of the AWS nomenclature.

Where to get: G-E Welding Distributors.

Subject: **Steels Handbook**

Content: A comprehensive handbook detailing a line of both tool and special purpose steels has been released for distribution. Illustrated and described are steels for complete maintenance and repair purposes. Included are non-tempering steel, pneumatic, and shock steel, turned-ground and polished shafting steel, various types of heat treated alloy steels for those "problem jobs," brake die steel, oil hardening die steel and abrasive resisting plates. Additional pages cover types for rebuilding worn crawler grousers and for filler bar applications. The handbook also includes welding instructions for maintenance applications,

The MAJORITY of Your Heavy Hauling Jobs can be handled PROFITABLY with... the POPULAR

ROGERS Type "T"

LARGE CAPACITY IN AN 8 FT. DECK WIDTH—LEGAL IN ALL STATES. 8 TIRES ON 2 ROCKING STUB AXLES WITH LEVEL OR DROP DECK IN 15, 20, 25, 30 and 35 TON CAPACITIES

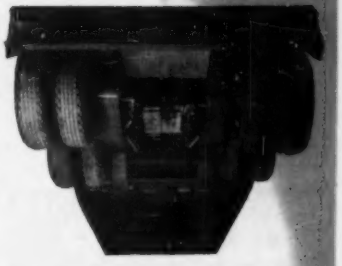
By reason of its versatile adaptability to all kinds of heavy hauling jobs, the Rogers Type "T" has steadily increased in popularity.

It's a "natural" for small and large contractors and haulers.

If you are considering the purchase of one or more trailers, by all means investigate the Type "T".

It packs powerful advantages in a multi-purpose single unit.

Write for full details and catalog.



A worms-eye view of the sturdy rear end and frame construction of the famous "T".

The rear end design of the Type "T" has proved so efficient it has been adapted as standard construction in Rogers Power-Lift Detachable Gooseneck Trailers.

EXPERIENCE builds 'em — PERFORMANCE sells 'em

ROGERS BROS. CORP.

ALBION, PENNA.

136 ORCHARD STREET

"ROGERS I BEAM OR GIRDER TRAILER"

Export Office: 50 Church St., New York 7, N. Y., U. S. A. Cable Address: Brosites

tables and useful information on steel hardness numbers plus approximate hardness conversion numbers for steel. Still another section gives users technical data such as decimal equivalents. The colorful, 22-page literature contains detailed specifications, applications, operating instructions and other vital technical information which can be used by plant operating personnel.

Where to get: Pyramid Steel Co., Cleveland, O.

Subject: **Scrapers**

Content: A bulletin describes the new Caterpillar No. 10 and No. 15 scrapers. The No. 10 has a capacity of 7 cu. yd. struck while the No. 15 has a 10 yd. capacity. The bulletin presents specifications and pictures the attachments such as top extensions, push cup, and push block.

Where to get: Caterpillar Tractor Co., Peoria 8, Ill.

Subject: **Hydraulic Tool Idea Book**

Content: For the first time, a comprehensive job-picture book is available to show how hydraulic tools can solve production, construction, maintenance and other problems. Called the *Idea Book*, the 64 pages of this data are labeled as "1001 valuable shortcuts with hydraulic tools and hand tools." Many large photos and simple, brief descriptions chart job ideas developed and successfully applied. Products include remotely controlled hydraulic jack equipment called "Porto-Power"—plus gauge-equipped and standard hydraulic jacks. Also involved are pipe benders, knock-out punches, hydraulic pumps, torque indicators and hand tools. Typical job photos suggest the general principles of the applications. Accompanying drawings, suggest how standard or shop built attachments work in scores of combinations with "Porto-Power" hydraulic rams to solve special or routing problems.

Where to get: Blackhawk Manufacturing Co., Milwaukee 1, Wis.

Subject: **Crusher Repair**

Content: Rebuilding and repairing various types of crushers with Manganal, 11-13½% manganese-nickel steel is the subject of an informative new folder just released. Cleverly illustrated, the folder relates how roll crushers, jaw crushers and corrugated, smooth and concave gyratory crushers can be entirely rebuilt and repaired with Manganal bare or special Tite-Kote electrodes and Manganal round applicator bars. Procedure details on how to weld Manganal round applicator bars into the different types of illustrated crushers are also included.

Where to Get: Stulz-Sickles Co., 134 Lafayette St., Newark, N. J.

Subject: **Hydraulic Hoists Bulletins**

Content. A new series of 15 technical data bulletins descriptive of the complete line of Galion hydraulic hoists is now being issued. Each bulletin includes full specifications for one individual hoist. Among the data listed is: hoist type, weight, stroke, cylinder diameter, mounting height, dump angle and piston rod diameter. Bulletins are illustrated with large close-up hoist photos and application pictures. Hoist pumps are shown in detailed, cut-a-way form. An interesting bulletin feature is a handy hoist capacity reference table. This permits the user to easily check the body length and approximate overhang against the desired hoist capacity.

Where to get: Galion Allsteel Body Co., Galion, O.

Subject: **Lincoln School of Welding**

Content: The Lincoln School of Welding, Cleveland, O., recently issued a seven-page bulletin which reviews the school's programs and activities. The Lincoln School was inaugurated in 1917 when the U. S. Army purchased welding equipment from the Lincoln factory and specified in the purchase that Lincoln train soldiers in welding. Since that time the school has been turning out professional welders for industry at a rate averaging better than 1,000 a year. During World War II the school operated 24 hours a day with four separate classes held during each 24 hour period. The basic course at the Lincoln School consists of four weeks' training and practice with a new class starting every week. Lincoln conducts the school as a service to industry and only a nominal charge for materials is made. Advance courses in special welding techniques are also available. The school lists 35,000 graduates. A. E. Madson is the school director.

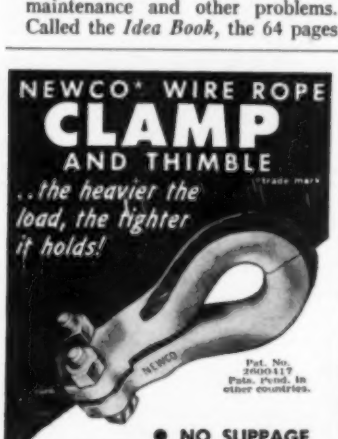
Where to get: Lincoln School of Welding, Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, O.

Subject: **Rod Cutter**

Content: The new bulletin illustrating and describing the latest Model 200-E Guillotine Hydraulic Cutter gives complete specifications and information on this unit. This new cutter provides 20 tons thrust to cut ½-in. carbon steel rod in ¼ second with push-button control.

Where to get: Manco Manufacturing Co., Bradley, Ill.

NEWCO* WIRE ROPE
CLAMP
AND THIMBLE
(trade mark)
..the heavier the load, the tighter it holds!



● NO SLIPPAGE
● 9 SIZES TO FIT WIRE ROPES FROM ¼" TO 1"
● DEVELOPS 85 TO 90% ULTIMATE ROPE STRENGTH (95 to 100% Catalog List)

The strongest and most efficient attachment for wire rope. Made of permanent castings with standard replaceable bolts and nuts. NO WRONG SIDE—threads either way. Easy to install and never needs lubricating.

See your distributor or write direct to

NEWMAN MFG. & SALES CO., Inc.
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DREDGES
HYDRAULIC
DIPPER
CLAMSHELL

Bolted sectional steel hulls for landlocked, inland waters

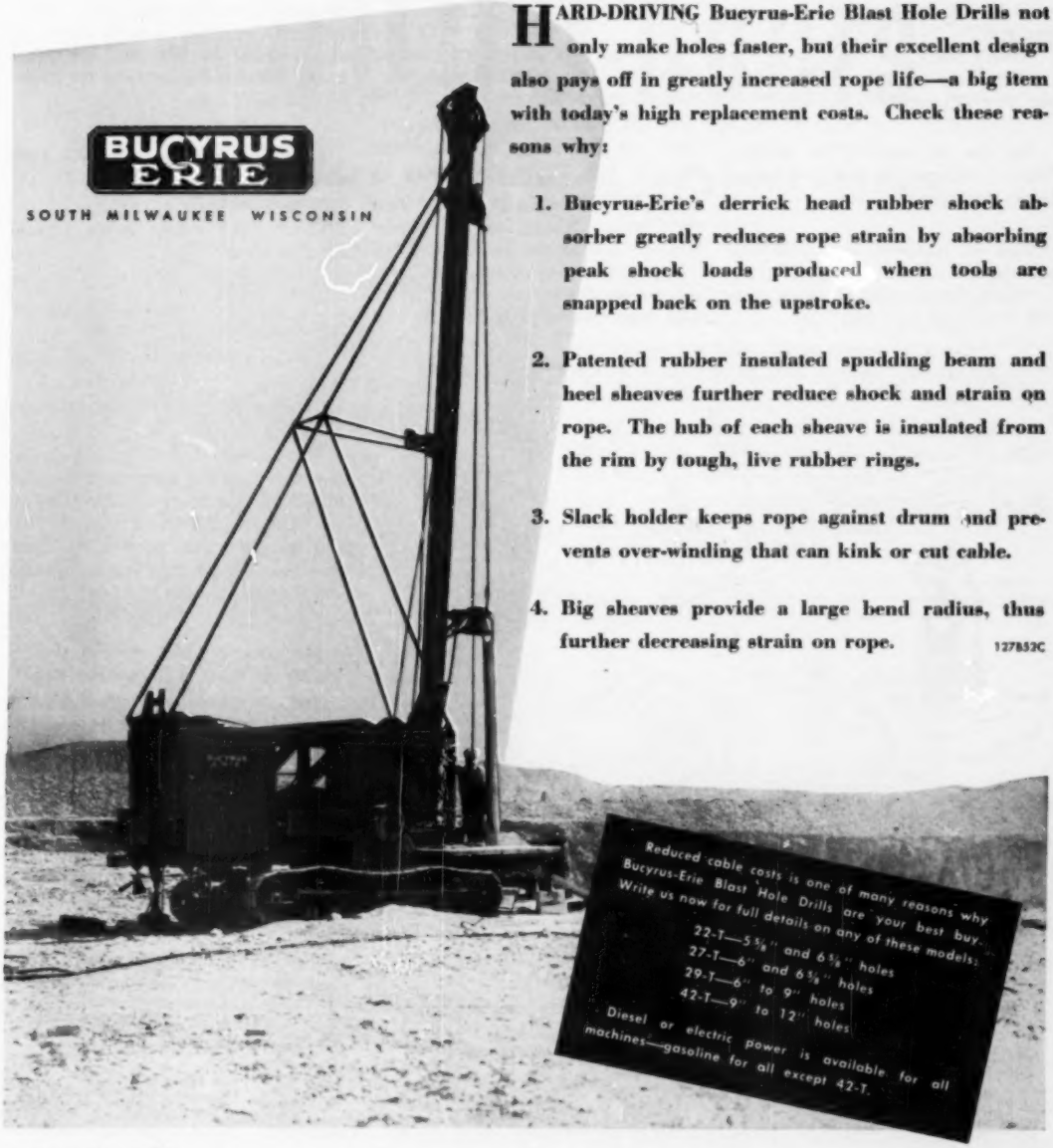
If you need a dredge, write us!

AMERICAN STEEL DREDGE CO. INC.
FORT WAYNE 1 · INDIANA · U.S.A.

DESIGNERS AND BUILDERS OF DREDGING EQUIPMENT SINCE 1905

How Bucyrus-Erie Drills

Stretch Rope Life


BUCYRUS ERIE
SOUTH MILWAUKEE WISCONSIN
Reduced cable costs is one of many reasons why Bucyrus-Erie Blast Hole Drills are your best buy. Write us now for full details on any of these models:
22-T—5⅝" and 6⅝" holes
27-T—6" and 6⅝" holes
29-T—6" to 9" holes
42-T—9" to 12" holes
Diesel or electric power is available for all machines—gasoline for all except 42-T.

HARD-DRIVING Bucyrus-Erie Blast Hole Drills not only make holes faster, but their excellent design also pays off in greatly increased rope life—a big item with today's high replacement costs. Check these reasons why:

1. Bucyrus-Erie's derrick head rubber shock absorber greatly reduces rope strain by absorbing peak shock loads produced when tools are snapped back on the upstroke.

2. Patented rubber insulated spudding beam and heel sheaves further reduce shock and strain on rope. The hub of each sheave is insulated from the rim by tough, live rubber rings.

3. Slack holder keeps rope against drum and prevents over-winding that can kink or cut cable.

4. Big sheaves provide a large bend radius, thus further decreasing strain on rope.

127853C

NOT in the *Contract*

The hunter's bird dog came to a point looking straight at a stranger. The hunter looked all around, but couldn't see a single bird. Finally he said to the stranger: "That's odd. My dog never did that before."

"Perhaps I can explain," said the stranger. "My name is Partridge."

"She treats her husband like a Grecian god."

"How's that?"

"She places a burnt offering before him at every meal."

Said the old maid to the burglar: "Sure, I have money. Don't just stand there—frisk me."

This ad appeared in a Mid-West newspaper:

"Black formal, size 12, worn once. Sell or trade for baby bed."

Joe: "Is it true that an alligator won't bother you if you carry a torch?"

Moe: "That just depends on how fast you carry it."

Waitress (looking at the nickel tip left by a shovel runner): "What are you trying to do, big boy, seduce me?"

A foreign newspaper correspondent picked up the following news item, straight out of Moscow:

"What," asked the first Russian, "was the nationality of Adam and Eve?"

"There can be no doubt but that they were citizens of the Soviet Union," replied the second Russian. "They had nothing to wear, nothing to eat but an apple—and yet they were told they were living in paradise."

"Ha," he says — "Ha, I know a water pipe when I see one — Ha - -."

A man, apparently very much upset, approached the police sergeant at the local station house and reported his wife missing. The sergeant began writing a report.

"What size is she?" . . . "Oh, about average."

"Color eyes?" . . . "Oh, neutral, I guess."

"Color hair?" . . . "Don't know."

"Kind of clothes?" . . . "Hat and coat, I suppose. But she had a dog with her."

"What kind?" . . . "Pedigreed collie. Stands six hands high, weighs 38 lbs., brownish-grey spot above right eye, right rear leg is solid white, is slightly deaf in left ear, has deep brown collar and answers to the name of Prince!"

Customer: "I was asked to buy either a casserol or a camisole. I can't remember which."

Clerk: "That's easy. Is the chicken dead or alive?"

The veteran porter was briefing the new man on the routine of his job.

"Above all, always be polite and use tact," instructed the older man.

"I follow the polite stuff but what do you mean by tact?"

"Well now, I'll just give you an example . . . one day I happened to open a door and there was a lady sitting in the bath tub. I shut the door quickly and said. 'Beg your pardon, Sir!' The 'beg your pardon' was just politeness, but the 'sir' . . . that was tact."

Mechanic: "Which do you prefer, leather or fabric auto upholstering?"

2nd Mechanic: "I like fabric; leather is too hard to wipe your hands on."

Colonel (after reviewing troops): "Hang it all! What's the idea of parading all the big men in front of the little men?"

Lieutenant: "It's the sergeant's idea, sir. He used to run a fruit store."

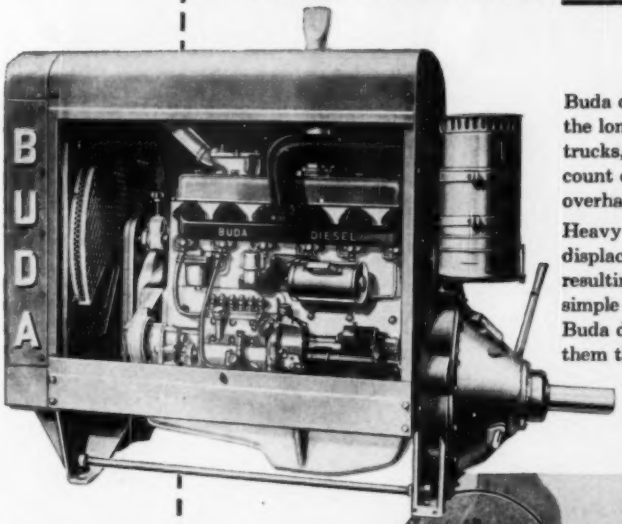
Sister's Suitor: "Johnny I dislike to tell you, but last night at the party your sister promised to become my wife. Can you forgive me for taking her away?"

Johnny: "Shucks, that's what the party was for."

BUDA DIESELS

average 6000 hours

before overhaul in toughest service



Buda dyna-swirl Diesels are heavy duty built for the long run. Whether they power crushers, trucks, scrapers, shovels or dozers—you can count on an average 6000 or more hours before overhaul. This means money in your pocket.

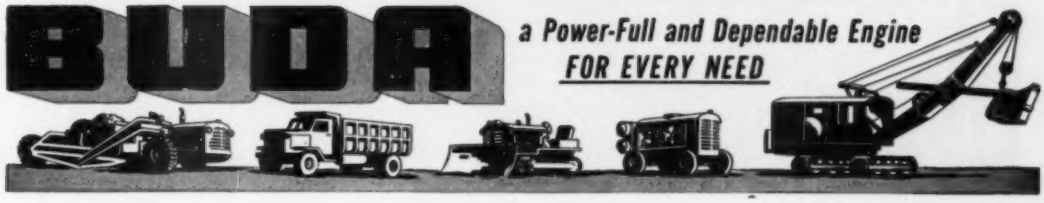
Heavy duty construction . . . . 10 to 17% greater displacement . . . . controlled turbulence combustion resulting in lower peak pressures . . . . "clean" simple design with fewer parts are only a few Buda dyna-swirl Diesel advantages that make them the longest-life engines in the business.

Ask your nearby Buda Engine Distributor to prove Buda Diesel Superiority today. There's no obligation. Write for illustrated Bulletin and data. The Buda Co., Harvey, Illinois

Buda 844 Diesel engine powering Telsmith Crusher

BC-25

BUDA *a Power-Full and Dependable Engine* ***FOR EVERY NEED***



Now . . .

STRENGTH WITHOUT

there's extra profit for you with the All-Purpose HYDROCRANE

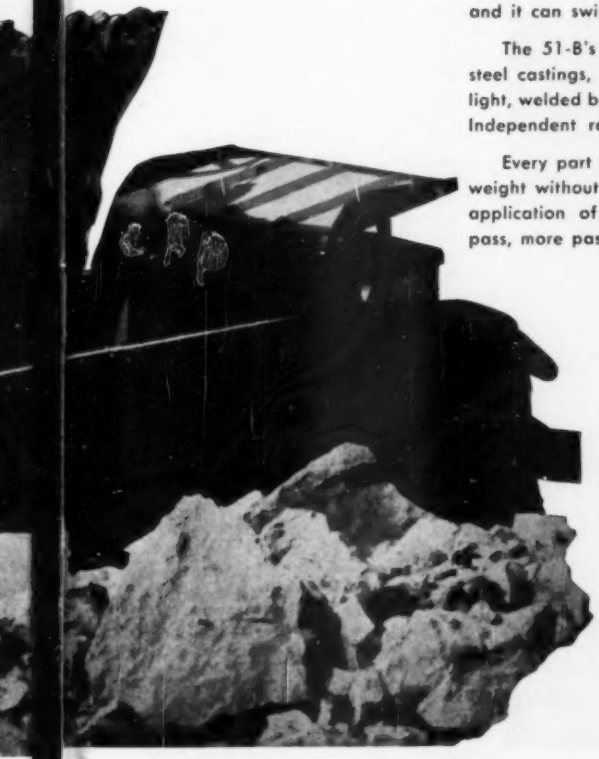
— on jobs too small for large machines . . . too big to do safely and efficiently by hand. For instance, its full hydraulic control is so precise that concrete pipe can be eased down a fraction of an inch at a time . . . avoiding breakage and danger to workers. It's easily convertible, too . . . to dragshovel front-end, Hydrohoe.

DEADWEIGHT . . .

counts more than ever

and it's yours with Bucyrus-Erie's 2-yd. 51-B

⅜ to 4-yd. Gasoline, Diesel, Electric Excavators



HERE'S an excavator that combines built-in durability with weight economy to give bigger output with less maintenance.

For instance, the 51-B's revolving frame is a single box-section casting of annealed steel . . . specially developed and cast by Bucyrus-Erie. This solid "backbone" provides real rigidity for machinery alignment — yet holds weight to a minimum. As a result, vibration is minimized in the 51-B . . . and it can swing fast, work at a profit-building pace.

The 51-B's truck frame and caterpillar side frames are single annealed steel castings, too — for strength with light weight. Boom and handle are light, welded box-sections that provide ample strength for all working stresses. Independent rope crowd eliminates the need for heavy boom machinery.

Every part of the 51-B reflects advanced engineering that cuts out dead weight without compromising strength. This means you get most economical application of power and lowest upkeep — with bigger payloads every pass, more passes every day. 66E52C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

Most Compared
Most Preferred

Notes from the manufacturers

Allis-Chalmers Co., Milwaukee, Wis., announced the appointment of George A. Gillespie as resident manager of the Paris, France, office for the Tractor Division. Gillespie has been territory sales manager for Europe, North Africa, and the Middle East since joining Allis-Chalmers in 1948. In his new position he will supervise sales of the company's Tractor Division products throughout continental Europe.

American Brake Shoe Co., New York 17, N. Y., announced the election of Kempton Dunn as first vice president, William B. Jordan as treasurer, Robert Watts and Owen B. Cottle as assistant treasurers. Dunn was formerly vice president and treasurer. He has been with Brake Shoe since graduating from college in 1932. He became treasurer in 1942 and was secretary of the company from 1947 to 1949. He is also a director of the company. Jordan, who was formerly assistant treasurer, joined the American Brakeblok Division of the Company in 1945. He became division comptroller in 1950 and then transferred to the New York headquarters and was elected assistant treasurer. Following graduation from college Jordan served as a Naval aviator before coming to the company. Watts was formerly assistant credit manager. He joined the company in the treasury department in 1949, becoming administrative assistant in 1951. He served in the Marine Corps during World War II. Following his service, he attended college and joined Brake Shoe upon graduation. Cottle was formerly assistant insurance manager. He joined the company in the treasury department in 1946 and bcame administrative assistant in 1951. He served in the Army Air Corps in World War II.

Blaw-Knox Co., Pittsburgh, Pa., lists the following personnel changes in the construction equipment department: S. M. Pare, who has held several positions in the department during the past 22 years, has been appointed assistant manager of the department. For several years, Pare has been an assistant to R. P. McKenrick, manager of the department. Increased business in the steel forms department will require L. J. Sarosdy to devote full time to his position as manager and chief engineer of the steel forms department and to relinquish his duties as chief engineer of the construction equipment department. He will also serve as engineering consultant on construction equipment. C. F. Mittelstadt has been promoted from assistant chief engineer to chief engineer of the department.

Caterpillar Tractor Co., Peoria, Ill. has named Jerry G. Wilson engine sales supervisor in the Sales Development division. Wilson, who has been a special representative in the Sales Development division since joining Caterpillar in 1950, will coordinate and direct activities of engine representatives. He matriculated at Northwestern University and the University of Wisconsin and later worked successively for Superior Engine Division of National Supply Co., Heavy Machinery Sales of Nordberg Manufacturing Co. and the Diesel Department of Fairbanks-Morse & Co.

Cummins Engine Co., Inc., Columbus, Ind., recently announced two new appointments: C. R. Boll, Jr., as general sales manager; C. B. Foster as sales manager. Boll will be responsible for engine, parts and contract sales, the company regional organization, advertising and sales development. Until his promotion, Boll was manager—engine sales—a position he had held since December, 1948. His career at Cummins started in 1941 as a sales engineer following his graduation from Purdue University. During World War II, Boll served as an officer in the Signal Corps, receiving special training in electronics at the University of Chicago, Harvard and M.I.T. In 1945 and 1946, Boll was a staff officer in General MacArthur's Headquarters, both in Mani'a and Tokyo. He worked on radio and radar countermeasures and civil communications problems. Upon his return from service, Boll rejoined the company, and in May, 1947 was promoted to assistant regional manager, Great Lakes region, with headquarters in Cleveland, O. He served in this capacity until his appointment as manager—engine sales in 1948. Foster, who will continue to be in charge of all government contract work, will also take over the duties of the former position of manager—engine sales. Foster joined the company in 1950 as national

Continued on page 64

BUILT TO DO THE JOB . . .
Omaha Dragline Buckets are built to do the job better—faster. All unnecessary weight has been eliminated. A higher arch gives more clearance for digging and dumping and makes room for a bigger load. Available in four types. Send for complete catalog giving description and specifications.
OMAHA
DRAGLINE BUCKETS
DRAKE-WILLIAMS-MOUNT • OMAHA, NEBR.

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES AND DRAGLINES

1¼ YDS. AND UP

Page 625 diesel walking dragline. 150 ft. boom, 9 cu. yd. bucket, 4 years old. Good operating condition. Price $150,000. Loaded on cars. Location Middle East. Box 3486

Bucyrus-Erie 320-B electric shovel, serial No. 4957, mounted on AMSCO shovel crawlers, operating on 4100 volts with Ward-Leonard control; equipped with 75 ft. boom, 54 ft. dipper handle and 12 cu. yd. bucket. Machine can be inspected and is available immediately. Good condition. Write, wire or phone:

Pioneer Mining Corporation
Appleton City, Missouri

2—9-W Bucyrus Monighan Draglines.
1—5-W Bucyrus Monighan Dragline.
1—200-W Bucyrus Monighan Dragline.
1—120-B Bucyrus Elect. Dragline & Shovel.
1—44-B Bucyrus Dragline & Shovel.
1—9-W in Ohio—others in Wash. & Idaho.

J. A. TERTELING & SONS, INC.
Box 1428
Boise, Ida.
Ph. 4-3576

Bucyrus-Erie 75-B shovel in good operating condition. Recently completely overhauled. Priced right. Location West Coast.

Granite Rock Company
Watsonville, California

Immediate delivery P&H Model 1400 electric stripping shovel, guaranteed excellent condition, 48 ft. boom, 34 ft. sticks, 3¾ yd. bucket, large inventory of parts.

Harmon Creek Coal Corporation
1606 First National Bank Bldg.
Pittsburgh 22, Pennsylvania
Phone GRant 1-1474

SMALL SHOVELS, CRANES AND DRAGLINES

UP TO 1¼ YDS.

Used Koehring Model 304 crane Serial No. C-2638 equipped with Buda Model 4K-28-10488-C gasoline engine Serial No. 254659. (Just reconditioned.) Mounted on 6 wheel Model KSC-2-8 (CU-15); oscillating front axle; bevel gear final drive (1.00 to 1.00); outriggers front and rear, 14.00 x 20 tires; 18" frame; 156" wheel base; Manufacturer Six Wheels, Inc., Los Angeles, Calif.

Used Bucyrus-Erie 10-B shovel with 13'6" boom; 11' handle; ¾ cu. yd. dipper; 14" wide treads, equipped with Hercules 6 cylinder gasoline engine. Shovel Serial No. 14288. (Has been owned by one owner since shipment in 1938.)

Used Bucyrus-Erie 10-B positive crowd shovel with 13'6" boom, 11' handle, ¾ yd. cast front dipper fully enclosed steel cab, power boom hoist, caterpillar mounting 9'1" long overall, 7'8" wide overall, 14" wide treads; equipped with Buda 6 B-230 6 cylinder gasoline engine No. 306052 with electric starter. Machine No. 60098.

Stuart M. Christhilf & Co., Inc.
134-136 W. Mt. Royal Ave. Baltimore 1, Md.

SHOVELS - CRANES - DRAGLINES
We specialize in used late model machinery of all types and sizes, including Northwest, Bucyrus-Erie, Koehring, Lima and Lorain units. All machinery in sound operating condition. Complete attachments for above available.
SALES Reasonable Prices RENTALS
J. C. French, 226 Berry Pkwy., Park Ridge, Ill.
Tel. TAlcott 3-4927

Koehring model 1005 Diesel shovel, 2½ cu. yd. dipper. Delivered new, 1949. Located south central Missouri. Immediate delivery.
Box 3485

Insley K-10 full revolving crane, 30' boom, crawler mounted.

Wood Lumber Company
815 N. 13th Street Birmingham, Alabama

Northwest model 25; 6; 80D; 95. Manitowoc 4500; 4500 new — will rent. Bucyrus 54-B; Monighan 5W; 7W; 9W; 450.
A. W. Nevers Phone 32 Mt. Pleasant, Iowa

Bucyrus-Erie 15-B shovel. Serial No. 24147. This machine has 16" treads, is powered with Buda gasoline engine that has been rebuilt within the last six months, is in good operating condition and can be seen operating any day at Bonne Terre, Mo. Price $6750. For further information, contact:

E. Paul Black
Flat River, Mo. Phone 212-J

BARGAINS
SHOVELS—DRAGLINES

Bucyrus-Erie 22-B ¾ yd.—GMC diesel engine.
Northwest 25 ¾ yd.—GMC diesel engine.
Lorain 41 ¾ yd.—Cat. diesel engine.
Koehring 205 ½ yd.—Int. diesel engine.

R. S. Armstrong & Bro. Co.
676 Marietta St. N.W.
Atlanta 3, Georgia
Phone LAmar 6434

Northwest Model 5 gasoline dragshovel and dragline. Northwest Model 3 gasoline clamshell and dragline. These machines, in spite of age, are in first class operating condition. Located Detroit Area. Box 3492

Bucyrus-Erie 37-B diesel shovel and 55 foot boom dragline. New in 1943. Also Bucyrus-Erie 44-B diesel dragline with 60 foot boom. New in 1946. Both machines in good operating condition.

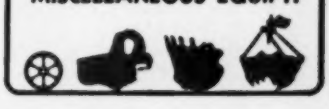
F & S Contracting Company
1300 Chicago Street
Butte, Montana

Practically new Bucyrus-Erie Model 22-B dragline, 50 foot boom, Caterpillar diesel engine, extra counterweight. Serial No. 96264. Presently working near Kansas City. Box 3494

LIMA 604 COMBINATION DRAGLINE AND CLAMSHELL 90 ft. boom, 30 ft. jib—hackbitch gantry—worm drive boom hoist—Rud-O-Matic tag-line — fairlead — long crawlers, 16 ft. 10" long overall—34" wide pads—Cummins Diesel engine.
Late 1948 machine—Serial No. 4643. Excellent condition—located in Trenton, N. J.

Cayuga Foundation Corporation
Attn.; Mr. Lawrence Lazar
30 Vesey St. New York, N. Y.

MISCELLANEOUS EQUIPT.



Shovel-front end equipment complete for Bucyrus-Erie 22-B. Used only two weeks. Located at Coldwater, Michigan. Priced reasonably.
Box 3491

Continued on page 64

For Sale

Continued from page 63

DREDGE FOR SALE

Modern 4½-ft. Bucyrus Diesel-Electric gold dredge now operating West Africa for sale early 1953. Possibilities conversion for gravel or channel deepening operations — Westrop, Brattleby, Lincoln, England.

USED EQUIPMENT

BUCYRUS-ERIE Model S-90, 4-wheel 8 to 10 yd. scraper.
ALLIS-CHALMERS Model HD-14C tractor with Gar Wood hydraulic control unit.
ALLIS-CHALMERS Model AD motor grader powered by a GM 3-cylinder engine.
CATERPILLAR Model D-8 tractor with LeTourneau cable tip dozer.

For further information, contact

E. F. CRAVEN COMPANY
Phone 3-5521 P.O. Box 538
Greensboro, N. C.

Four Bucyrus-Erie 22-T drills, gasoline powered, complete with tools and stock of spare parts.
B-E No. 8 bit dresser complete with furnace, motors and blower.
Five Euclid 9.7 cu. yd. end dump trucks with new engines and good stock parts. All in good condition and ready to work.

Bradley Mining Company
Stibnite, Idaho

5 cu. yd. type VII, heavy duty, welded type dipper complete with door, bail, trip chain and back braces. Slightly used, but in excellent condition. Bargain price $4000, F.O.B. Nario, Ohio.

Basic Refractories, Inc.
Maple Grove, Ohio.

PROPERTY FOR SALE

For Sale: A warranty deed to 100% of the oil and gas on 40 unleased acres comprising the north half of the south half of the northeast quarter of section twenty-six, township nineteen, range fifty-three located 20 miles northwest of Glendive in the Cedar Creek Anti-cline area of the Williston Basin of Montana. Some of the discoveries have proven reserves in excess of half a million barrels of oil per acre. This is opportunity. Investigate. Priced at $40,000 by the original owner.

Ted A. Whitmer, Bloomfield, Montana

WANTED

WANTED: 4-yd. lightweight Sauerman Crescent Scraper. Box 3490

Wanted: Used gold dredge with 6000 cu. yds. capacity per 8 hours and digging depth of about 30 feet. Write giving price and location. Box 3488

Wanted: Oversize caterpillar mounting for Bucyrus-Erie Model 44-B. Box 3489

POSITION WANTED

General superintendent or superintendent available: 30 years experience and qualifications; supervising, estimating, and building all types highways, airports, heavy excavating, large sewers, earth-filled dams, levies, covering several states. Honest, sober, and reliable, know cost and equipment. Interpret plans and organizing. Box 3464

Shovel, dragline, clamshell, crane operator and overhaul or troubleshooting maintenance of construction equipment. Rock quarry, construction and general excavating plant experience. Will refer you to superintendents worked with and type equipment worked on request. Box 3495

May We Help You?

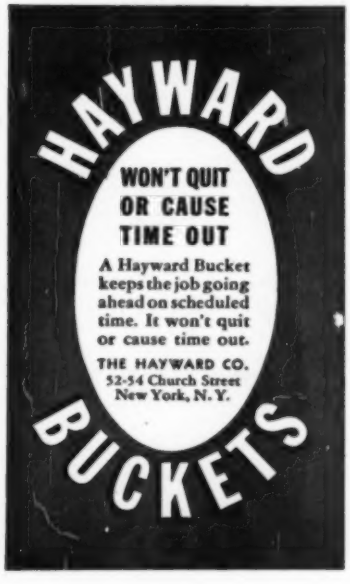
If you do not find the equipment you want listed in these columns, write to:

Excavating Engineer
South Milwaukee Wisconsin

Notes

Continued from page 62

accounts representative. In 1951 he was appointed manager — contract sales—a position he held until his present promotion. Foster, immediately prior to joining Cummins, was assistant to the operating vice president of the Truax-Traer Coal Co. Foster is a graduate of Purdue.



Detroit Diesel Engine Division of General Motors, Detroit 28, Mich., has announced the appointment of two zone sales representatives. Eugene K. Cook and William R. Bays will supervise distributor and dealer sales in two midwestern zones with headquarters respectively in Detroit, Mich. and Lincoln, Neb. Cook is an engineering graduate of General Motors Institute and joined Detroit Diesel in 1944. Bays joined the Division in 1937 as a field service representative.

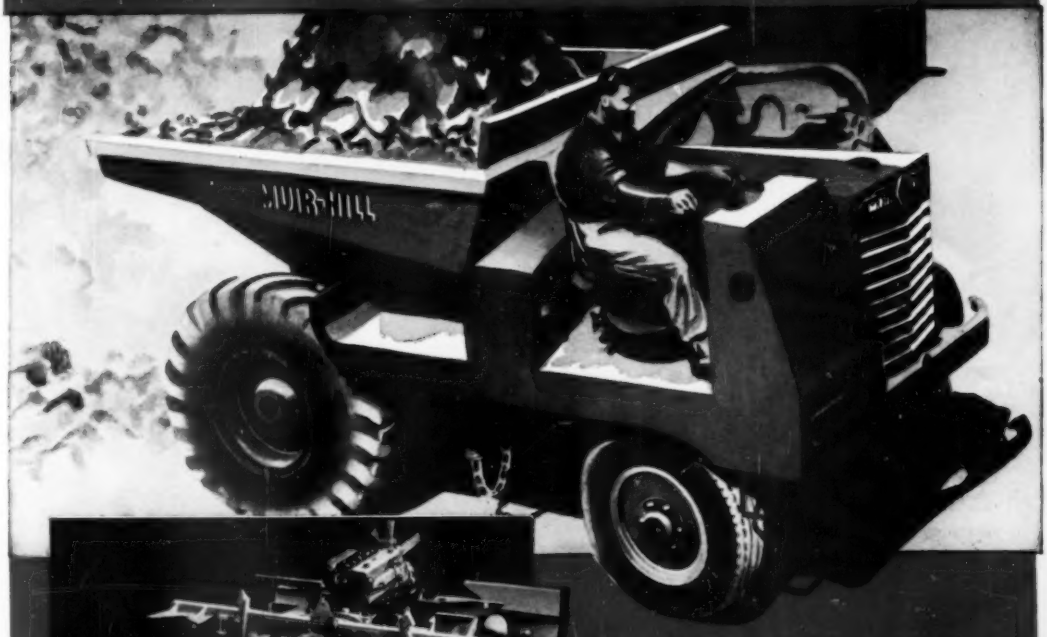
Euclid Road Machinery Co., Cleveland 17, O. announced the appointment of Philpott Equipment Co. of Seattle as distributor of Euclid earthmoving equipment for the western half of Washington and Alaska. The Washington territory consists of all counties west of and including Whatcom, Skagit, Chelan, Kittitas, and Yakima with the exception of the southern counties of Klickitat, Skamania, Cowlitz, Clark and Wahkiakum. The firm is headed by George M. Philpott who also operates equipment offices in California and Oregon. J. G. Woodford, who has been associated with the construction equipment industry for many years is manager of Washington and Alaskan operations. Ward Meyers is parts manager and Frank Godfrey is service manager. Branches in Alaska are at Anchorage and Fairbanks, managed by Carl Lottsfeld and Warren Sullivan.

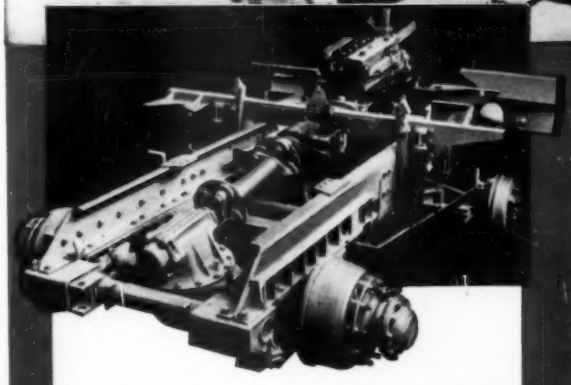
Fageol Heat Machine Co., Detroit 11, Mich., has announced the appointment of Loren G. Barnes as district sales manager for Illinois, Wisconsin and Minnesota. Barnes was formerly division sales manager of The Universal Gear Corp., Indianapolis, Ind. His experience also includes service as personnel director, Commercial Trade Institute, Chicago Trade School. His headquarters will be in Chicago.

MacWhyte Co., Kenosha, Wis., wire rope manufacturer, has announced that E. C. Berg, G. Johnston and M. A. Buntrock have been elected directors. E. C. Berg was appointed vice president and controller. G. Johnston was appointed treasurer and assistant secretary. M. A. Buntrock has been secretary and assistant treasurer.

Westinghouse Air Brake Co., Wilmerding, Pa., has purchased a majority interest in Le Roi Co., Milwaukee, Wis. Le Roi manufactures engines, portable compressors and rock drills. It has 1,500 employees in its three divisions: Milwaukee, Cleveland and Greenwich, O. The name, organization, officers, employees, plant locations and operations of Le Roi Co. will be retained.

Strength with FLEXIBILITY





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This is a chassis built to stand up to the worst conditions which construction work can offer and will save dollars on maintenance and repair, just as the instantaneous gravity tip action saves time on the job.

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RUGGED CONSTRUCTION

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There is no Dumper in the world like this British-built Muir-Hill 4½ yarder. Over twenty years know how is built into this—the most advanced unit in its field. Just off the press is a new Muir-Hill publication giving the whole story. Write us today for a free copy.

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The Muir-Hill 14B MODEL 4½ CU. YD. DUMPER

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THE WORLD'S BIGGEST DUMPER BUILDERS

dm EB 194

GYRO-FLO supplying air to two wagon drills in a quarry.

GYRO-FLO operating backfill tampers on a highway construction job.

GYRO-FLO supplying air to paving breakers on street repair work.

GYRO-FLO powering two wagon drills on a canal project.

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GYRO-FLO Portables are at the top of the list with hundreds of contractors because there are no valves to leak . . . no pistons, rods or clutch to wear. Discharge temperatures of less than 200°F mean longer hose life. "Air-Glide" capacity control takes the strain off engines by providing stepless regulation of engine speed and compressor output from 0 to 100%. The compressor is really matched to the higher speeds of GM diesels and Continental gasoline engines.

All four GYRO-FLO sizes, 105, 210, 315 and 600 cfm, have been proven on the toughest jobs all over the country. In blistering heat or bitter cold, at sea level or high altitudes GYRO-FLO Rotary Compressors have met every test.

The GYRO-FLO is smaller, simpler, lighter in weight and easier to maintain than any portable compressor ever built before. Your nearest I-R representative will be glad to give you the full story.

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